

FIFTY-SECOND
SESSION
1966/67



UBC

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1966-67

ACADEMIC YEAR

1966

August

- 1 Monday Last day for submission of applications by students applying for admission to the University for the first time.
Last day for submission of applications by students for admission to the School of Architecture.
Supplemental examinations, August 1 - 9.
- 15 Monday Faculty of Medicine, applications available for Session 1967-68.
Faculty of Pharmacy, although new students should apply by August 1, applications will be accepted up to August 15.
School of Nursing, last day for submission of applications, from students previously registered at the University, for admission to First Year Nursing "A" programme.
- 22-24 Monday-Wednesday Supplemental examinations for the Faculty of Medicine.
- 29 Monday School of Nursing, lectures begin for Second and Third Year students in the "A" programme who must complete registration on this date.

September

- 1 Thursday ACADEMIC YEAR 1966-67 begins.
Meeting of the Faculty of Medicine.
- 5 Monday Labour Day. University closed.
- 6 Tuesday School of Architecture, registration of First Year students; commencement of classes.
Faculty of Dentistry, registration and lectures begin.
Faculty of Forestry, start of 10-day field courses at Research Forest.
Faculty of Medicine, registration and lectures begin, First and Second Years.
School of Rehabilitation Medicine, registration and lectures begin.
- 7 Wednesday Meeting of Senate.
School of Architecture, registration of Second and Third Year students.
School of Librarianship, first class meeting, 9:30 a.m., Room 835, in School of Librarianship.
Faculty of Medicine, registration, Third Year.
School of Social Work, programme begins, and registration.

- 8 Thursday School of Librarianship, registration and introductory lectures, Thursday and Friday. First term fees payable at registration.
- 9 Friday Meeting of new students from other countries, 9:00 a.m., Lasserre 102.
- 10 Saturday Faculty of Medicine, registration, Fourth Year.
- 12 Monday Registration Week begins; registration procedure mailed to all students with Authorization forms. Registration takes place daily 8:30 a.m. to 4:30 p.m.
First Term fees due and payable on registration.
Programme for all new students, 9:00 a.m. Auditorium; programme continues throughout week.
Faculty of Agriculture field trip starts for students taking Agriculture 300.
Faculty of Forestry, start of 6-day field trip to Interior of B.C.
Faculty of Law, lectures begin, First Term. Registration must be completed on this date; late registration is not permitted. First Term fees are due and payable.
Faculty of Pharmacy lectures begin Third and Fourth Years. Registration must be completed on this date by Third and Fourth Year students.
- 16 Friday Registration closes, 4:30 p.m.
- 18 Sunday Assigned accommodation in residences available Sunday evening. Special arrangements for earlier registrants.
- 19 Monday Lectures begin, other Faculties.
- 23 Friday Last day for changes in Education courses; all changes must be reported to the Registrar's Office by Friday, 30th.
- 29 Thursday Joint meeting of the Faculties.
- 30 Friday Last day for changes in programme; all changes must be reported to the Registrar's Office by this date.
- October**
- 4 Tuesday Faculty of Education, first day for practice teaching, First Year Elementary, Second Year Secondary.
- 10 Monday Thanksgiving Day. University closed October 8, 10.
- 11 Tuesday Faculty of Education, first day for practice teaching Second Year Elementary, Fifth Year Secondary, One-Year course for Graduates.
- 12 Wednesday Faculty of Education meeting.
- 13 Thursday Annual Meeting of Medical Undergraduate Society, 12:30 - 2:30 p.m.

- 22 Saturday Homecoming.
 26 Wednesday Meeting of the Senate.

November

- 11 Friday Remembrance Day. Service in Memorial Gymnasium, 10:45 a.m. University closed.
 15 Tuesday Faculty of Education, Elementary Division, block practice teaching period, Nov. 15 - 22.
 16 Wednesday Faculty of Education, Secondary Division, block practice teaching, Nov. 16 - 23 (inclusive).
 29 Tuesday Faculty of Education meeting.

December

- 1 Thursday Meeting of the Faculty of Medicine.
 10 Saturday Last day of lectures for most Faculties.
 12 Monday Examinations begin for most Faculties.
 13 Tuesday School of Librarianship, examinations begin.
 14 Wednesday Meeting of the Senate.
 20 Tuesday First Term ends.
 25 Sunday Christmas Day. University closed December 24, 25, 26.
 31 Saturday Last day for submission of applications to the Faculty of Medicine for the session 1967-68.

1967**January**

- 1 Sunday New Year's Day. University closed January 1, 2.
 3 Tuesday Assigned accommodation in residences available Tuesday evening.
 4 Wednesday Second Term begins, Second Term fees are due and payable; students are advised to mail fees to Accountant by this date.
 Lectures resume, Faculty of Medicine.
 10 Tuesday Faculty of Education, practice teaching begins, all years Elementary, Second Year Secondary.
 11 Wednesday Faculty of Education, practice teaching begins, Fifth Year Secondary and One-Year course for Graduates.

February

- 7 Tuesday Faculty of Education meeting.
 15 Wednesday Meeting of the Senate.

- 16 Thursday Mid-term break, most Faculties, February 16, 17, 18, lectures and laboratories cancelled; Library and other facilities open.
- 20 Monday Faculty of Education, block practice teaching period, February 20 - March 3.

March

- 1 Wednesday Last day for application for April comprehensive examinations for Master's candidates.
- 15 Wednesday Last day for submission of applications for graduate scholarships.
- 24 Friday Good Friday. University closed. March 24, 25.

April

- 6 Thursday Meeting of the Faculty of Medicine.
- 7 Friday Last day for submission of Ed.D. thesis to candidates' committee for Congregation.
- 15 Saturday Last day for submission of Ph.D. theses to candidates' committees for Congregation.
Last day of lectures, most Faculties. Last day for submission of graduating essays and theses, Bachelor degree programmes, for Congregation, 1967.
- 17 Monday Sessional examinations begin, most Faculties.
- 22 Saturday Last day of lectures, First, Second and Third Years, Medicine.
Last day of lectures, School of Rehabilitation Medicine.
- 26 Wednesday School of Librarianship examinations begin.
- 28 Friday Last day for submission of Masters' theses to Departments for Congregation, 1967.
- 29 Saturday Faculty of Dentistry, last day for submission of applications.
Faculty of Medicine Sessional Examinations begin.
School of Rehabilitation Medicine sessional examinations begin.

May

- 1 Monday Last day for registration for Summer Session.
Faculty of Education two-week practice teaching period following sessional examinations.
- 4 Thursday Sessional examinations end, most Faculties.
Faculty of Applied Science, Field School begins.
Department of Geology Field School begins.
Accommodation in residences terminates.
- 5 Friday School of Librarianship examinations end.

- 11 Thursday Annual Meeting of the Alumni Association. (tentative)
- 18 Thursday Meeting of the Faculty of Medicine.
- 22 Monday Victoria Day. University closed.
- 24 Wednesday Meeting of the Senate.
- 30 Tuesday Baccalaureate Service, Brock Hall, 8:00 p.m.
- June**
- 2 Friday Congregation, Memorial Gymnasium 2:15 p.m.
Other Congregation dates, if necessary, to be announced.
- 30 Friday Last day for submission of application forms for B.C. Government Scholarships.
- July**
- 1 Saturday Dominion Day. University closed.
- 3 Monday Summer Session, lectures begin.
- 7 Friday Last day for submission of applications for supplemental examinations.
- 15 Saturday Last day for submission of applications for bur-saries.
- August**
- 1 Tuesday Last day for submission of applications for admission by new students.
Last day for submission of applications for the Faculty of Law.
Supplemental examination period August 1 - 9.
- 18 Friday Summer Session ends.
- 21 Monday Supplemental examinations, Faculty of Medicine, August 21, 22, 23, 24.
- 31 Thursday ACADEMIC YEAR ENDS.

1966-67

THE UNIVERSITY
of
BRITISH COLUMBIA

Governing Bodies

ADMINISTRATIVE STAFF

EMERITUS STAFF

STAFF OF MISCELLANEOUS DEPARTMENTS AND OFFICES

INSTRUCTIONAL AND RESEARCH STAFF

1966

Vancouver 8 • British Columbia • Canada

1966-67

The University of British Columbia

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Columbia.

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PHYLLIS G. ROSS, C.B.E., M.A., LL.D.
Term expires June, 1966

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JOHN B. MACDONALD, D.D.S., M.S., Ph.D., A.M. (Hon.), LL.D., F.A.C.D.

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Terms expire 1966

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WALTER C. KOERNER, K. St. J., LL.D., Vancouver. Term expires 1966.
LEON J. LADNER, Q.C., B.A., LL.B., Vancouver. Term expires 1966.
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ALLAN M. MCGAVIN, C.D., Vancouver. Term expires 1969.

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The President, Chairman.
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The Registrar, Secretary.

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Pharmacy: JOHN E. HALLIDAY, B.S.P., M.S., Ph.D.

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Terms expire 1966

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CYRIL S. BELSHAW, M.A., Ph.D.

Fritz K. BOWERS, M.A., Mem.I.E.E.E.

JOHN D. CHAPMAN, M.A., Ph.D.

HENRY ELDER, M.B.E., F.R.I.B.A., F.I.I.A.L.

JAMES G. FOULKS, B.A., Ph.D., M.D.

SYDNEY M. FRIEDMAN, B.A., M.D., C.M., M.Sc., Ph.D., F.R.S.C.

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BARNETT SAVERY, A.B., A.M., Ph.D.

ANTHONY D. SCOTT, B.Com., B.A., A.M., Ph.D.

THOMAS M. C. TAYLOR, B.A., M.S., Ph.D.

SIDNEY H. ZBARSKY, B.A., M.A., Ph.D.

Terms expire 1966.

Appointed by the Lieutenant-Governor in Council:

W. T. BROWN, M.B.E., E.D., B.A., M.A., Vancouver. Term expires 1967.

J. F. K. ENGLISH, M.A., Ed.D., LL.D., Victoria. Term expires 1966.

R. F. SHARP, B.A., D.Paed., Vancouver. Term expires 1967.

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Elected by Convocation:

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RICHARD M. BIBBS, B.A.Sc., West Vancouver.

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JOSEPH E. A. KANIA, M.A.Sc., Ph.D., Vancouver.

J. STUART KEATE, B.A., Victoria.

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 ERIC P. NICOL, M.A., Vancouver.
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 THE HON. MR. JUSTICE DAVID R. VERCHERE, B.A., Vancouver.
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Terms expire 1966.

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Terms expire 1966.

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NORMAN A. M. MACKENZIE, C.M.G., M.M. and Bar, Q.C., B.A., LL.B. (Dalhousie), LL.M. (Harvard), LL.D. (Mount Allison, New Brunswick, Toronto, Ottawa, Bristol, Alberta, Glasgow, Dalhousie, St. Francis Xavier, McGill, Sydney, Rochester, Alaska, California, British Columbia), D.C.L. (Whitman, Saskatchewan), D.Sc.Soc. (Laval), D.Litt. (Memorial), Hon. Fellow, St. John's College, Cambridge, F.R.S.C. (1962).

Deans Emeriti

F. M. CLEMENT, B.S.A. (Toronto), M.A. (Wisconsin), D.Sc. (Brit. Col.), F.A.I.C., Dean Emeritus of Agriculture (1949).

JOHN NORISON FINLAYSON, M.Sc. (McGill), LL.D. (Man.), D.Sc. (Laval and Brit. Col.), M.E.I.C., Mem. Am. Soc. C.E., Dean Emeritus of Applied Science (1950).

H. J. MACLEOD, O.B.E., B.Sc. (McGill), M.Sc. (Alta.), A.M., Ph.D. (Harvard), D.Sc. (Brit. Col.), Fellow A.I.E.E., Dean Emeritus of Applied Science (1953).

HENRY F. ANGUS, B.A. (McGill), B.C.L., M.A. (Oxon.), LL.D. (McGill, Brit. Col.), F.R.S.C., Dean Emeritus of Graduate Studies (1956).

MISS M. DOROTHY MAWDSLEY, B.A. (McGill), M.A. (Brit. Col.), Ph.D. (Chicago), Dean Emerita of Women (1959).

E. D. MACPHEE, M.M., M.A., B.Ed. (Edinburgh), C.A. (Hon.), LL.D. (Alta., Brit. Col.), Dean Emeritus of Commerce and Business Administration (1960).

G. M. SHRUM, O.B.E., M.M., E.D., M.A., Ph.D. (Toronto), D.Sc. (Brit. Col.), F.R.S.C., Dean Emeritus of Graduate Studies (1961).

S. N. F. CHANT, O.B.E., M.A. (Toronto), LL.D. (Brit. Col.), Dean Emeritus of Arts and Science (1964).

F. H. SOWARD, B.A. (Toronto), B.Litt. (Oxon.), LL.D. (Carleton, Brit. Col.), Dean Emeritus of Graduate Studies (1964).

Registrar Emeritus

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- J. M. TURNBULL, B.A.Sc. (McGill), M.C.I.M., Professor Emeritus of Mining (1946).
- JOHN DAVIDSON, F.L.S., F.B.S.E., Professor Emeritus of Botany (1948).
- W. L. MACDONALD, B.A. (Toronto), M.A. (Wisconsin), Ph.D. (Harvard), Professor Emeritus of English (1948).
- MISS ISABEL MACINNES, M.A. (Queen's), Ph.D. (Calif.), LL.D. (Brit. Col.), Professor Emerita of German (1948).
- A. F. B. CLARK, B.A. (Toronto), Ph.D. (Harvard), Officier d'Académie, F.R.S.C., Professor Emeritus of French (1949).
- FRANK E. BUCK, B.S.A. (McGill), D.Sc. (Brit. Col.), Professor Emeritus of Horticulture (1949).
- M. Y. WILLIAMS, B.Sc. (Queen's), Ph.D. (Yale), F.G.S.A., F.R.S.C., Professor Emeritus of Geology (1949).
- FREDERICK READ, LL.B. (Man.), Professor Emeritus of Law (1950).
- FREDERIC G. C. WOOD, B.A. (McGill), A.M. (Harvard), Professor Emeritus of English (1950).
- E. A. LLOYD, B.S.A. (Sask.), M.S.A. (Washington State College), F.P.S.A., Professor Emeritus of Poultry Husbandry (1951).
- H. T. LOGAN, M.C., B.A. (McGill), M.A. (Oxon.), Professor Emeritus of Classics (1951).
- A. F. BARSS, A.B. (Rochester), B.S. in Agr. (Cornell), M.S. (Oregon Agri. Coll.), Ph.D. (Chicago), Professor Emeritus of Horticulture (1953).
- G. J. SPENCER, B.S.A. (Toronto), M.S. (Illinois), Professor Emeritus of Zoology (1953).
- ANDREW H. HUTCHINSON, M.A. (McMaster), Ph.D. (Chicago), F.R.S.C., Professor Emeritus of Biology and Botany (1954).
- H. M. KING, B.S.A. (Toronto), M.S. (Oregon State Coll.), Professor Emeritus of Animal Husbandry (1954).
- D. G. LAIRD, B.S.A. (Toronto), M.S., Ph.D. (Wisconsin), Professor Emeritus of Soil Science (1954).
- G. G. MOE, B.S.A., M.Sc. (McGill), Ph.D. (Cornell), Professor Emeritus of Agronomy (1954).
- C. WESLEY TOPPING, B.A., B.D. (Queen's), B.D., S.T.D. (Wesleyan Theol. College), S.T.M. (Union Theol. Seminary, New York), A.M., Ph.D. (Columbia), F.A.S.A., Professor Emeritus of Sociology (1954).
- FRANK DICKSON, B.A. (Queen's), Ph.D. (Cornell), Professor Emeritus of Biology and Botany (1956).
- ALEXANDER P. MASLOW, A.M. (Michigan), Ph.D. (Calif.), Professor Emeritus of Philosophy (1956).
- S. C. MORGAN, B.Sc. (Queen's), M.Sc. (Alta.), M.S. (Calif. Inst. of Technology), Mem. A.I.E.E., M.E.I.S., Professor Emeritus of Electrical Engineering (1956).
- WILLIAM J. ROSE, B.A. (Man.), M.A. (Oxon.), Ph.D. (Cracow), LL.D. (Brit. Col.), F.R.Hist.S., F.R.S.C., Professor Emeritus of Slavonic Studies (1956).
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- BIGGS, MARGARET, Sessional Lecturer, Chemistry.
- BINNING, B. C., Professor and Head, Department of Fine Arts.
- BIRD, E. A., Assistant Professor of French, Romance Studies.
- BIRKBECK, J. A., Assistant Professor and Markle Scholar in Medical Science, Paediatrics.
- BIRKETT, ALICE G., Associate Professor, Education.
- BISALPUTRA, E. B., Assistant Professor, Botany.
- BISMANIS, J. E., Associate Professor, Microbiology.
- BLACK, E. C., Professor, Physiology.
- BLACK, E. R., Assistant Professor, Political Science.
- BLACK, P. J., Post-Doctoral Teaching Fellow, Chemistry.
- BLACK, S., Professor, Education.
- BLAINE, E. R., Assistant Professor, Commerce and Business Administration.
- BLAIR, E. M., Honorary Lecturer, History of Medicine and Science.

- BLAIR, N. J., Clinical Instructor, Surgery (Otolaryngology).
- BLAIR, RUTH, Associate Professor, Home Economics, and Director of Food Services.
- BLAKELY, W. J., Part-time Lecturer, Planning.
- BLAND, J. S., Clinical Instructor, Psychiatry.
- BLENKINSOP, P. J., Lecturer in French, Romance Studies.
- BLOM, T. E., Assistant Professor, English.
- BLOOM, M., Professor, Physics.
- BOGOCH, A., Clinical Assistant Professor, Medicine.
- BOHN, E. V., Professor, Electrical Engineering.
- BOLDT, W., Assistant Professor, Education.
- BONGIE, L. L., Professor of French and Acting Head, Department of Romance Studies.
- BORDEN, ALICE, Assistant Professor, Education.
- BORDEN, C. E., Professor, German, Lecturer in Archaeology.
- BORROR, MERRA J., Instructor, Home Economics.
- BOSHER, J. F., Professor, History.
- BOSTON, FRANCES, Research Assistant, Cancer Research Centre.
- BOUGHTON, R. V., Professor, Education.
- BOULDING, J. E., Clinical Instructor, Psychiatry.
- BOURNE, C. B., Professor, Law.
- BOWERS, F., Instructor, English.
- BOWERS, F. K., Professor, Electrical Engineering.
- BOWMER, E. J., Clinical Instructor, Preventive Medicine.
- BOXALL, E. A., Clinical Instructor, Medicine.
- BOYCE, K. C., Clinical Instructor, Medicine.
- BOYD, R. W., Clinical Associate Professor, Medicine (Radiology).
- BOYES, D. A., Clinical Instructor, Obstetrics and Gynaecology.
- BOYES, F. C., Professor Emeritus, Part-time Assistant, Education.
- BOYLE, R. P., Lecturer, Sociology.
- BOYLES, SADIE M., Professor and Assistant Director, Secondary Education.
- BRACHER, WINIFRED J., Assistant Professor and Acting Head, School of Home Economics.
- BRADLEY, ELEANOR J., Instructor, Social Work; Supervisor, Child Health Programme.
- BRAGG, P. D., Assistant Professor, Biochemistry.
- BRAIDWOOD, BETTY, Dietitian, Home Economics.
- BRAMWELL, C. A., Clinical Instructor, Preventive Medicine.
- BRANCA, The Hon. Mr. Justice A. E., Lecturer, Law.
- BRANION, R. M. R., Assistant Professor, Chemical Engineering.
- BRATTY, P. J. A., Clinical Instructor, Neurology, Rehabilitation Medicine.
- BRAUNER, C. J., Associate Professor, Education.
- BRAY, J. N., Assistant Professor, Commerce and Business Administration.
- BREADON, R. E., Director, University Forest.
- BREARLEY, ANNE, Part-time Lecturer, Librarianship.
- BREARLEY, KATHERINE, Assistant Professor of French, Romance Studies.

- BREDIN, GRACE, Associate Professor, Education, and Supervisor of the Child Study Centre.
- BREE, A., Associate Professor, Chemistry.
- BREEZE, J. E., Honorary Lecturer, Electrical Engineering.
- BRESSLER, D. W., Assistant Professor, Mathematics.
- BRETT, DAWN L., Assistant Professor, Social Work.
- BRINK, V. C., Professor, Plant Science.
- BRION, C. E., Assistant Professor, Chemistry.
- BRISCALL, MARGARET C., Lecturer, Commerce and Business Administration.
- BROCKINGTON, J., Associate Professor and Head, Department of Theatre.
- BROCKLEY, C. A., Professor, Mechanical Engineering.
- BROOKS, W. R. T., Part-time Assistant, Education.
- BROOM, E. F., Instructor, Physical Education and Recreation.
- BROOME, E. B., Professor and Assistant Director, Elementary Education.
- BROSAMLER, G. A., Assistant Professor, Mathematics.
- BROUGH, S., Assistant Professor, Education.
- BROUGHTON, R. V., Professor, Education.
- BROWN, B. S., Assistant Professor, Mathematics.
- BROWN, D., Lecturer in Voice, Music.
- BROWN, D. G., Associate Professor, Philosophy.
- BROWN, FLORENCE, Lecturer, Education.
- BROWN, H., Part-time Assistant, Education.
- BROWN, H. K., Lecturer, Dentistry.
- BROWN, J. C., Assistant Professor, Physiology.
- BROWN, L. C., Assistant Professor, Metallurgy.
- BROWN, L. E., Associate Professor, Education.
- BROWN, MARGARET, Assistant Professor, Education.
- BROWN, S. R., Associate Professor, Physical Education and Recreation.
- BROWN, T. H., Associate Professor, Pharmacy.
- BROWN, W. G., Associate Professor, Mathematics.
- BROWN, W. T., Instructor, Psychiatry.
- BRUMMITT, J. R., Director, Child Health Programme, Preventive Medicine; Instructor, Paediatrics.
- BRYANS, F. E., Professor and Head, Department of Obstetrics and Gynaecology.
- BRYNER, C., Professor, Slavonic Studies.
- BRYSON, B. F., Clinical Instructor, Psychiatry.
- BUCHANAN, ARMELDA, Instructor, Mathematics.
- BUCHANAN, F. G., Part-time Assistant, Education.
- BUCHANAN, R. L., Post-Doctoral Research Fellow, Chemistry.
- BUCK, A., Part-time Assistant, Education.
- BUCK, H. W. L., Clinical Instructor, Medicine (Dermatology).
- BUCKLER, W. S., Lecturer, Rehabilitation Medicine.
- BUCKLEY, A., Post-Doctoral Research Fellow, Chemistry.
- BULLEN, P. S., Associate Professor, Mathematics.
- BURES, D. C. J., Associate Professor, Mathematics.
- BURGESS, R. E., Professor, Physics.

- BURKE, B. E., Associate Professor, Commerce and Business Administration.
 BURLING, R. W., Associate Professor, Physics, Oceanography.
 BURNES, J. S. D., Clinical Instructor, Surgery.
 BURNS, W. T., Honorary Lecturer, Plant Science.
 BURTON, A. F., Assistant Professor, Biochemistry, Cancer Research Centre.
 BUTTERS, R. G., Assistant Professor, Metallurgy.
 BYERLEY, J. J., Research Associate, Metallurgy.
- CAIRNS, A. R. M., Assistant Professor, Medicine; and Markle Scholar in Medical Science.
 CAIRNS, H. A. C., Associate Professor, Political Science.
 CAMBON, K. G., Clinical Instructor, Surgery. (Consultant, Otolaryngologist; Paediatrics.)
 CAMERON, D. A., Lecturer, English.
 CAMERON, E. C., Instructor, Physiology.
 CAMPANELLA, R. G., Assistant Professor, Civil Engineering.
 CAMPBELL, EILEEN, Assistant Professor, Nursing.
 CAMPBELL, J. J. R., Professor and Head, Department of Microbiology.
 CAMPBELL, K. A., Clinical Instructor, Paediatrics.
 CAMPBELL, MARGARET A., Assistant Professor, Nursing.
 CAMPBELL, P. READ, Associate Professor, Education.
 CANNON, G. H., Associate Professor, Education.
 CAPELLE, PAULINE M. A., Assistant Professor, Nursing.
 CAPUTO, M., Associate Professor, Geophysics, Mathematics.
 CARLYLE, W. M., Lecturer, Law.
 CARNEY, R. J., Assistant Professor, Education.
 CARPENTER, C. W., Assistant Professor, Obstetrics and Gynaecology.
 CARROLL, J. J., Clinical Instructor, Surgery (Anaesthesiology).
 CARROW, ANNE, Lecturer, Home Economics.
 CARRUTHERS, B. M., Instructor, Medicine.
 CASHMORE, A., Clinical Instructor, Psychiatry (Child Psychiatry).
 CAVERS, S. D., Professor, Chemical Engineering.
 CAWSTON, H. ELIZABETH, Instructor, Nursing.
 CAYFORD, A. H., Assistant Professor, Mathematics.
 CHAKLADER, A. C. D., Assistant Professor, Metallurgy.
 CHAMBERS, H. L., Clinical Instructor, Surgery (Urology).
 CHANG, B., Assistant Professor, Mathematics.
 CHANG, F., Professor, Asian Studies, Philosophy.
 CHANG, J., Clinical Assistant Professor, Surgery (Anaesthesiology).
 CHANG, Y., Instructor, Sociology.
 CHAPMAN, G. J., Honorary Lecturer, Commerce and Business Administration.
 CHAPMAN, J. D., Professor, Geography.
 CHARLES, S. C., Visiting Assistant Professor (Research), Chemistry.
 CHARLTON, W. J., Clinical Instructor, Surgery.
 CHASE, W. H., Associate Professor, Pathology.
 CHATTERJEE, K. K., Post-Doctoral Research Fellow, Chemistry.
 CHAVE, ESTELLE, Part-time Lecturer, Social Work.
 CHEN, H.-T., Assistant Professor, Asian Studies.

- CHERRY, S., Associate Professor, Civil Engineering.
 CHING, HILDA, Research Associate, Zoology.
 CHINN, H., Teaching Assistant, Electrical Engineering.
 CHINNERY, M. A., Assistant Professor, Geophysics.
 CHISHOLM, G. B., Clinical Professor, Psychiatry.
 CHISHOLM, H. A., Clinical Instructor, Pathology.
 CHITTY, D. H., Professor, Zoology.
 CHONG, D. P., Assistant Professor, Chemistry.
 CHRISTIANSEN, BETH, Research Assistant, Cancer Research Centre.
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 CHRISTENSEN, R. M., Clinical Instructor, Surgery; Rehabilitation Medicine.
 CHRISTIAN, R. R., Associate Professor, Mathematics.
 CHRISTOPHERSON, E. F., Clinical Instructor, Medicine.
 CHUD, B., Instructor, Social Work.
 CHUNG, MADELINE H., Clinical Instructor, Obstetrics and Gynaecology.
 CHUNG, W. B., Associate Professor, Surgery, Rehabilitation Medicine.
 CICCONE, STEFANIA, Instructor in Italian, Romance Studies.
 CLAMAN, A. D., Assistant Professor, Obstetrics and Gynaecology.
 CLAPHAM, J. C., Part-time Lecturer, Architecture.
 CLARK, C. W., Associate Professor, Mathematics.
 CLARK, R. J., Honorary Lecturer, Physics.
 CLARK, R. M., Professor, Economics, and Director of the Office of Academic Planning.
 CLARKE, HELEN M., Lecturer, English.
 CLARKE, ISOBEL J., Research Associate, Zoology.
 CLARKE, M. F., Honorary Lecturer, Plant Science.
 CLARKE, R. P. A., Assistant Professor, Architecture.
 CLARKE, S., Part-time Assistant, Education.
 CLEMENS, W. A., Professor Emeritus, Special Lecturer, Zoology.
 CLINGMAN, A. E., Associate Professor, Education.
 CLUFF, J. W., Clinical Assistant Professor, Surgery (Neurosurgery); Rehabilitation Medicine.
 COADY, C. J., Clinical Associate Professor, Pathology.
 COCKCROFT, G., Lecturer, Education.
 COHEN, A., Clinical Instructor, Ophthalmology.
 COHN, W., Associate Professor, Sociology.
 COLES, E. M., Instructor, Psychiatry.
 COLE, KATHLEEN, Associate Professor, Botany.
 COLLISON, D. B., Clinical Instructor, Obstetrics and Gynaecology.
 COLTON, ESTHER, Instructor, Education.
 COMPTON, KATHRYN, Instructor of Piano and Music History, Music.
 CONSTANTINIDES, P., Professor, Anatomy.
 CONWAY, J. S., Associate Professor, History.
 COOK, C. E., Clinical Instructor, Surgery (Orthopaedics)
 COOMBES, J., Lecturer, Music.
 COOMBES, J. R., Assistant Professor, Education.
 COOPE, J. A. R., Assistant Professor. Chemistry.

- COOPER, H. G., Clinical Instructor, Surgery (Urology).
 COPLEY, R., Assistant Professor, Geography.
 COPP, D. H., Professor and Head, Department of Physiology.
 COREY, MARGARET J., Research Fellow, Paediatrics.
 CORFMAN, NANCY A., Lecturer, Botany.
 CORNISH, LORRAINE, Part-time Assistant, Education.
 COTTINGHAM, MOLLIE, Associate Professor and Assistant Director of Student Teaching.
 COTTON, J. D., N.R.C. Post-Doctoral Fellow, Chemistry.
 COUFAL, SHERLE, Part-time Assistant, Education.
 COULTHARD, T. L., Professor, Agricultural Mechanics.
 COUPE, R. L., Instructor, (Dermatology), Medicine.
 COURTEMANCHE, A. D., Clinical Instructor, Surgery; Rehabilitation Medicine.
 COVAL, S. C., Associate Professor, Philosophy.
 COVELL, H. M., Professor, Education.
 COVERNTON, C. C., Clinical Instructor, Medicine.
 COWAN, I. M., Professor, Zoology, and Dean of the Faculty of Graduate Studies.
 COX, A. E., Lecturer, Psychology.
 COX A. R., Associate Professor, Medicine.
 COX, L., Assistant Professor, Mechanical Engineering.
 COX, MARGARET, Research Fellow, Paediatrics.
 COY, P., Clinical Instructor, Surgery.
 CRADDOCK, M. K., Assistant Professor, Physics.
 CRAGG, R. C., Professor, Fine Arts.
 CRAIG, K. D., Assistant Professor, Psychology.
 CRAMER, C. F., Associate Professor, Physiology.
 CRANE, J. A., Associate Professor, Social Work.
 CRAWFORD, G. M., Clinical Instructor, Surgery (Therapeutic Radiology).
 CREECH, R., Lecturer in Horn, Music.
 CREIGH, G., Assistant Professor, English.
 CRITCHLOW, P. R., Assistant Professor, Physics.
 CROCKER, C., Lecturer in Flute, Music.
 CROOKER, A. M., Professor, Physics.
 CROOKS, M. J., Assistant Professor, Physics.
 CROSS, K. J., Assistant Professor, Planning.
 CROUCH, L. G. R., Professor, Mineral Engineering.
 CRUMB, J. A., Professor, Economics.
 CULLEN, W. R., Associate Professor, Chemistry.
 CULLING, C. F. A., Senior Instructor, Pathology.
 CUNLIFFE, MURIEL A., Professor, Social Work.
 CURTIS, G. F., Professor and Dean of the Faculty of Law.
 CURZON, F. L., Associate Professor, Physics.
 CUSTANCE, BARBARA, Lecturer in Piano, Music.
 CZAYKOWSKI, B., Assistant Professor, Slavonic Studies.

- DAEM, CLAIRE, Instructor, Home Economics.
- DALBY, F. W., Professor, Physics.
- DALLAS, DOROTHY, Professor of French, Romance Studies.
- DANIELS, ELIZABETH, Assistant Professor, Physics.
- DANIELLS, R., University Professor of English Language and Literature.
- DANNER, W. R., Associate Professor, Geology.
- DARNBROUGH, RHODA, Part-time Assistant, Education.
- DARRACH, M., Professor and Head of the Department of Biochemistry.
- DAVIDSON, A., Lecturer, Geology.
- DAVIDSON, A. E., Clinical Associate Professor, Psychiatry.
- DAVIDSON, G. A., Clinical Professor, Psychiatry.
- DAVIES, K. J., Clinical Instructor, Psychiatry.
- DAVIES, LOIS, Clinical Instructor, Surgery (Anaesthesiology).
- DAVIS, T. W., Clinical Instructor, Medicine.
- DAVISON, EMILIA, Lecturer in Spanish, Romance Studies.
- DAY, SHELAGH, Lecturer, English.
- DEAN, J., Assistant Professor, Paediatrics.
- DE BRUYN, J., Associate Professor, English.
- DEHNEL, P. A., Associate Professor, Zoology.
- DE JONG, S. H., Associate Professor, Civil Engineering.
- DELAVALT, R. E., Associate Professor, Geology.
- DE MARIA, F. J., Assistant Professor, Obstetrics and Gynaecology.
- DEMPSTER, J. R. H., Honorary Lecturer, Mathematics.
- DENHOLM, D. A., Lecturer, Pharmacy.
- DENNISON, J. D., Assistant Professor, Education.
- DERRY, D., Professor, Mathematics.
- DE SOBRINO, L., Associate Professor, Physics.
- DE STEFANIS, GIUSEPPINA, Instructor in Italian, Romance Studies.
- DEVENYI, MARGARET, Sessional Lecturer, Chemistry.
- DEVRIES, A. G., Assistant Professor, Psychology.
- DE VRIES, J., Instructor, Soil Science.
- DEYELL, EDITH, Associate Professor, Education.
- DICK, J., Clinical Instructor, Medicine.
- DICKERSON, R. W. V., Assistant Professor, Law.
- DICKINSON, J. H., Clinical Instructor, Obstetrics and Gynaecology.
- DINGMAN, F., Instructor, Social Work.
- DIVINSKY, N. J., Professor, Mathematics.
- DIXON, G. H., Associate Professor, Biochemistry.
- DIXON, L. B., Part-time Lecturer in Lumber Grading, Forestry.
- DIXON, W. G., Professor and Director, School of Social Work.
- DOBEREINER, J. F., Lecturer, Education.
- DODDS, W. A., Clinical Assistant Professor, Surgery (Anaesthesiology).
- DOHENY, J. R., Instructor, English.
- DOIDGE, FLORENCE, Lecturer, Zoology.
- DOLL, W. A., Clinical Instructor, Surgery.

- DOLMAN, C. E., Professor, Microbiology, History of Medicine and Science.
 DOLMAN, C. L., Clinical Associate Professor, Pathology.
 DOMI, DARIEN, Lecturer, Botany.
 DONALDSON, D. J., Instructor, Economics.
 DONALDSON, R. W., Assistant Professor, Civil Engineering.
 DONNELLY, K. R., Assistant Professor, Anatomy.
 DONOVAN, E. G., Clinical Instructor, Medicine (Radiology).
 DORAN, DARIEN, Research Associate, Agricultural Economics.
 DORLING, M. J., Assistant Professor, Agricultural Economics.
 DOROTICH, D., Assistant Professor, Slavonic Studies.
 DOUGHTY, J. H., Clinical Instructor, Preventive Medicine.
 DOUGLAS, J. Senior Instructor, Electrical Engineering, Architecture.
 DOUGLAS, MAUREEN A., Research Associate, Zoology.
 DOUGLAS, P., Instructor, Music.
 DOUGLAS, R. R., Instructor, Mathematics.
 DOUGLAS, S. E., Research Associate, Pharmacology.
 DOWER, G. E., Associate Professor, Pharmacology.
 DOWNEY, L. W., Professor of Educational Administration, Education.
 DOWNING, C. ELIZABETH, Part-time Assistant, Education.
 DOWNS, B. V., Part-time Lecturer, Architecture.
 DOYLE, P. J., Clinical Instructor, Surgery (Otolaryngology).
 DRAKE, D., Assistant Professor, Mathematics.
 DRAKE, R., Research Associate, Zoology.
 DRANCE, S. M., Associate Professor, Ophthalmology.
 DRINNAN, J. H., Honorary Lecturer, Electrical Engineering.
 DRUEHL, JOANNE, Lecturer, Zoology.
 DRUEHL, L. D., Instructor, Botany.
 DRUMMOND, G. I., Professor, Pharmacology.
 DRYER, THE HON. MR. JUSTICE V. L., Lecturer, Law.
 DUFF, D. C. B., Professor, Microbiology.
 DUNCAN, J. P., Professor and Head, Department of Mechanical Engineering.
 DUNELL, B. A., Professor, Chemistry.
 DUNLOP, C. R. B., Assistant Professor, Law.
 DUNMORE, SANDRA, Dietitian, Home Economics.
 DUNN, H. G., Associate Professor, Paediatrics.
 DUNN, W. L., Assistant Professor, Pathology, Cancer Research Centre.
 DUNNING, R. W., Professor, Anthropology.
 DURRANT, G., Professor and Head of the Department of English as from
 July 1, 1966.
 DUSING, W. J., Instructor, Classics and Assistant to the Dean of the Faculty
 of Arts.
 DUTTON, G. G. S., Professor, Chemistry.
- EAGLES, B., Professor and Dean of the Faculty of Agriculture.
 EASTHAM, J. W., Honorary Curator, Botany.
 EATON, DOREEN M. L., Assistant Director of Food Services, Home Economics.

- EATON, G. W., Associate Professor, Plant Science.
 EDEN, J., Clinical Professor, Pathology.
 EDINGER, H. G., Assistant Professor, Classics.
 EDWARDS, JOYCE D., Instructor, Paediatrics.
 EDWARDS, MARY J., Instructor, English.
 EFFORD, I., Associate Professor, Zoology, Fisheries.
 EGOFF, SHEILA A., Assistant Professor, Librarianship.
 EINSTEIN, F., Post-Doctoral Fellow, Chemistry.
 ELDER, A. JEAN, Assistant Professor, History.
 ELDER, H., Professor and Director, School of Architecture.
 ELIOT, C. W. J., Associate Professor, Classics.
 ELLIOT, A. J., Professor and Head, Department of Ophthalmology.
 ELLIOT, G. R. F., Professor and Acting Head of the Department of Preventive Medicine.
 ELLIOT, J. A., Clinical Assistant Professor, Surgery.
 ELLIOTT, G. B., Clinical Associate Professor, Pathology.
 ELLIOTT, M., Assistant Professor, Education.
 ELLIS, H. M., Honorary Lecturer, Electrical Engineering.
 ELLIS, H. W., Special Assistant, Poultry Science.
 ELLIS, R. M., Assistant Professor, Geophysics, Earth Sciences.
 ELLIS, T. E. H., Lecturer, Law.
 ELLISON, LUCILLE, Clinical Instructor, Surgery (Therapeutic Radiology).
 EMERY, C. L., Professor, and Head, Department of Mineral Engineering.
 ENGLAND, A. B., Instructor, English.
 ENGLISH, J. T., Assistant Professor, Law.
 ENGLISH, R. A., Clinical Instructor, Pathology.
 EPSTEIN, N., Professor, Chemical Engineering.
 ERDMAN, K. L., Professor, Physics.
 ERICKSON, A. C., Associate Professor, Architecture.
 ERICKSON, G. P., Assistant Professor, Geophysics.
 ERICKSON, O. D., Lecturer, English.
 ESDALE, W. L., Clinical Instructor, Surgery (Anaesthesiology).
 ESPERANCA, M. J., Research Fellow, Paediatrics.
 EVANS, A. M., Clinical Assistant Professor, Surgery (Therapeutic Radiology).
 EVANS, G. P., Fellow, Preventive Medicine.
 EVELYN, K. A., Professor, Medicine (Director, G. F. Strong Laboratory for Medical Research).
 FAHRNI, B. M., Associate Professor and Director, Rehabilitation Medicine.
 FAHRNI, W. H., Clinical Instructor, Surgery (Orthopaedics), Rehabilitation Medicine.
 FARISH, J. R., Clinical Instructor, Surgery.
 FARLEY, A. L., Associate Professor, Geography.
 FARMER, J. B., Associate Professor, Chemistry.
 FARRINGTON, A., Post-Doctoral Research Fellow, Chemistry.
 FARSTAD, L., Honorary Lecturer, Soil Science.
 FEENEY, MOIRA C., Assistant Professor, Home Economics.

- FENSOM, K. G., Honorary Lecturer in Forest Products, Forestry.
- FIDDES, K., Part-time Assistant, Education.
- FIDLER, H. K., Clinical Professor, Pathology.
- FIEDLER, E. G., Assistant Professor, Education.
- FIELD, F., Lecturer, Commerce and Business Administration.
- FIELDS, D. B., Associate Professor, Commerce and Business Administration.
- FINLAY, D. G., Associate Professor, Social Work.
- FINN, W. D., Professor and Head, Department of Civil Engineering.
- FINNEGAN, C. V., Professor, Zoology.
- FIRTH, J. J. F., Lecturer, Philosophy, Religious Studies.
- FISCHER, P. H. H., Post-Doctoral Teaching Fellow, Chemistry.
- FISH, ELAINE, Lecturer, Zoology.
- FISHER, H. D., Professor, Zoology.
- FISHER, K. J., Clinical Instructor, Psychiatry.
- FISHER, MARIAN R., Part-time Assistant, Education.
- FISHMAN, SHEROLD, Clinical Assistant Professor, Pathology.
- FITZPATRICK, R. E., Honorary Lecturer, Plant Science.
- FLEMING, K. O., Clinical Instructor, Ophthalmology.
- FORD, D. K., Associate Professor, Medicine (Canadian Arthritis and Rheumatism Society Research).
- FORD, P., Associate Professor, Zoology.
- FORNATARO, J. V., Associate Professor, Social Work.
- FORSTER, MARY, Instructor, Education.
- FORSYTH, J. S., Professor and Head, Department of Chemical Engineering.
- FORWARD, A. D., Instructor, Surgery.
- FORWARD, F. A., Professor, Metallurgy. (On leave.)
- FOSTER, M. I., Assistant Professor, Education.
- FOSTER, R. E., Professor, Forestry.
- FOULKES, J. G., Professor and Head, Department of Pharmacology.
- FOWLER, A. G., Honorary Lecturer, Mathematics.
- FRANCIS, D. W., Assistant Professor, Zoology.
- FRANCIS, G. H., Clinical Associate Professor, Surgery (Otolaryngology), Rehabilitation Medicine.
- FRANKLYN, HEATHER, Assistant Professor in French, Romance Studies.
- FRASER, C. W., Lecturer, Librarianship.
- FRATKIN, L. B., Clinical Instructor, Surgery.
- FREDEMAN, W. E., Associate Professor, English.
- FRESCHI, B., Part-time Lecturer, Architecture.
- FREYMAN, J., Lecturer, Slavonic Studies.
- FRIEDLANDER, E., Lecturer in Cello, Music.
- FRIEDMAN, CONSTANCE L., Research Associate Professor, Anatomy.
- FRIEDMAN, S. M., Professor and Head, Department of Anatomy.
- FRIESEN, A. J. D., Instructor, Pharmacology.
- FRIZ, C. T., Assistant Professor, Anatomy.
- FRODERBERG, A. J., Assistant Professor, Mathematics.
- FROESE, CHARLOTTE, Professor, Mathematics.

- FROST, D. C., Associate Professor, Chemistry.
 FROST, J. W., Clinical Instructor, Surgery.
 FULTON, J. B., Clinical Instructor, Surgery (Anaesthesiology).
 FURNESS, ANNE, Associate Professor, Social Work.
 FURSTONWALD, MARIA, Assistant Professor, German.
- GAFFNEY, DONNA, Research Assistant, Cancer Research Centre.
 GAGE, W. H., Professor, Mathematics; Dean of Inter-Faculty and Student Affairs.
- GALBRAITH, MARGARET, Lecturer, English.
 GAMBLE, F., Associate Professor, Education.
 GANSHORN, J. A., Clinical Instructor, Surgery.
 GARDNER, D. G., Assistant Professor, Dentistry.
 GARDNER, E. H., Associate Professor, Soil Science.
 GARDNER, J. A. F., Professor and Dean of the Faculty of Forestry.
 GARNER, F. O. R., Clinical Instructor, Medicine.
 GARNETT, G., Instructor, English.
 GARRETT, MARILYN A., Lecturer, Zoology.
 GARROW, D. G., Clinical Instructor, Medicine (Radiology).
 GARROW, BARBARA M. A., Clinical Instructor, Medicine (Neurology).
 GAYMAN, G. R., Clinical Assistant Professor, Paediatrics.
 GAYTON, J. L., Honorary Lecturer in Public Health Administration, Preventive Medicine.
 GAYTON, R. J., Lecturer, Commerce and Business Administration.
 GAZETAS, A., Assistant Professor, Theatre.
 GEARY, G., Lecturer in Piano, Music.
 GEORGE, D. V. E., Post-Doctoral Teaching Fellow, Chemistry.
 GERLACH, E., Assistant Professor, Mathematics.
 GERSON, W., Professor, Architecture.
 GERWING, JULIA, Assistant Professor, Microbiology.
 GETZ, L., Assistant Professor, Law.
 GIBBARD, D. C., Associate Professor, Education.
 GIBBARD, J. E., Associate Professor and Assistant to the Director of Secondary Education.
 GIBBONS, M., Assistant Professor, English, Education.
 GIBSON, E. M. W., Part-time Lecturer, Architecture.
 GIBSON, J. M., Special Lecturer, Forestry.
 GIBSON, J. M., Clinical Instructor, Surgery (Therapeutic Radiology).
 GIBSON, W. C., Professor and Head of the Department of History of Medicine and Science; Director, Kinsmen Laboratory for Neurological Research.
 GIESE, RACHEL, Associate Professor of Italian, Romance Studies.
 GILLESPIE, D. C., Assistant Professor, Education.
 GILLESPIE, H. S., Clinical Instructor, Surgery (Orthopaedics).
 GILLILAND, H. C., Honorary Professor, Education.
 GILROY, MARION, Assistant Professor, Librarianship.
 GILSON, D. F. R., Lecturer, Chemistry.

- GLADSTONE, W. A. F., Post-Doctoral Fellow, Chemistry.
- GNUP, F. T., Senior Instructor, Physical Education and Recreation.
- GOETZ, MARKETA C., Associate Professor, German.
- GOFTON, J. P., Clinical Instructor, Medicine.
- GOLDBERG, M., Assistant Professor, English.
- GOLDIE, H. J., Honorary Lecturer, Electrical Engineering.
- GOLDMAN, R., Instructor, Asian Studies.
- GOLLEDGE, MARGARET R., Assistant Professor, Education.
- GOMEL, V., Clinical Instructor, Medicine.
- GOODEVE, A. M., Assistant Professor, Pharmacy.
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- GRANT, ROSEMARY, Lecturer, Zoology.
- GRANT, W. L., Professor, Classics, Education.
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- GRAY, E. J., Clinical Instructor, Surgery.
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- GRAY, R. F., Associate Professor, Education.
- GREENWOOD, LILLIAN, Lecturer, English.
- GREGG, R. J., Associate Professor, Linguistics.
- GREIG, J. H., Clinical Instructor (Radiology), Medicine.
- GRENBERG, B. L., Assistant Professor, English.
- GREVEN, P. J., Assistant Professor, History.
- GRIER, HELEN, Part-time Assistant, Education.
- GRIFFITH, B. G., Professor, Forestry.
- GRIFFITHS, G. M., Professor, Physics.
- GRILL, E. V., Assistant Professor, Institute of Oceanography.
- GRONLUND, AUDREY F., Assistant Professor, Animal Science.

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- HAAR, D. T., Visiting Professor, Physics.
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- HARROP, T. J., Assistant Professor and Acting Head, Department of Restorative Dentistry.
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- HART, W. S., Assistant Professor, Fine Arts.
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- HICKS, HELGA, Instructor, Social Work.
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- HILL, L. E., Assistant Professor, History.
- HILL, R. H., Instructor, Paediatrics.
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- HOPWOOD, ALISON, Lecturer, English, Education.
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 KENNEDY, H. R., Clinical Instructor, Preventive Medicine.
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 KHARADLY, M. M. Z., Associate Professor, Electrical Engineering.
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 KIDD, K. H., Honorary Lecturer, Electrical Engineering.
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 KIRK, MADELEINE A., Lecturer, Home Economics.
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 Central Animal Depot.
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 KLIER, G. D., Demonstrator, Pharmacology.
 KLONOFF, H., Assistant Professor, Psychiatry (Psychology).
 KNICKERBOCKER, W. J., Clinical Instructor, Medicine (Radiology).
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- KNUTSON, H. C., Assistant Professor of French, Romance Studies.
 KNUTSON, LOUISE, Lecturer in French and Spanish, Romance Studies.
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 KRAINTZ, L., Professor, Dentistry (Oral Biology).
 KRAJINA, V. J., Professor, Botany.
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 KUIJT, J., Assistant Professor, Botany.
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 KUTNEY, J. P., Professor, Chemistry.
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 LANG, ROSEMARIE C., Instructor, Romance Studies.
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 LEDUC, R. J., Assistant Professor, Education.
 LEE, S. K., Sessional Lecturer, Chemistry.
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- LEHMANN, P. O. Clinical Instructor, Surgery (Neurosurgery).
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 LIBBY, W. G., Lecturer, Botany.
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 LYON, J. N., Assistant Professor, Law.
 LYSYK, K. M., Associate Professor, Law.

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- MACDONALD, J. S., Assistant Professor, Electrical Engineering.
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- OLSON, W. V., Instructor, Physics.
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- STEELE, R., Assistant Professor, Education.
- STEIMAN, I., Honorary Lecturer, History of Medicine and Science.
- STEIN, H. L., Professor and Director of Graduate Studies, Education, Mathematics.
- STEIN, JANET R., Associate Professor, Botany.
- STEINBERG, M. W., Professor, English.
- STEPHENS, D. G., Associate Professor, English.
- STEPHENS, J. M., Visiting Professor, Education.
- STEPHENSON, G. H., Clinical Instructor, Psychiatry.
- STEVENS, D. E., Demonstrator, Physiology.
- STEVENSON, G. BETH, Lecturer, Zoology.

- STEVENSON, JANIE, Assistant Professor, Education, Theatre.
 STEVENSON, S. W., Assistant Professor, English.
 STEWART, A. J., Clinical Instructor, Ophthalmology.
 STEWART, D., Lecturer, Music.
 STEWART, D. F., Post-Doctoral Teaching Fellow, Chemistry.
 STEWART, R., Professor, Chemistry.
 STEWART, R. W., Professor, Physics, Oceanography.
 STEWART, W. D., Clinical Instructor, Medicine (Dermatology).
 STOCK, J. J., Associate Professor, Microbiology.
 STOCKER, C. W., Instructor, History.
 STOCKTON, W. H. S., Clinical Instructor, Paediatrics.
 STOCKWELL, R., Instructor, Electrical Engineering.
 STORDY, S. N., Clinical Instructor, Medicine.
 STORM, T. F., Associate Professor, Psychology.
 STORR, A., Assistant Professor, Chemistry.
 STORR, JUDY, Research Assistant, Cancer Research Centre.
 STOVELL, MARY, Dietitian, Home Economics.
 STRACHAN, C. C., Honorary Lecturer, Plant Science.
 STRASSMANN, K. G., Assistant Professor, Theatre.
 STREET, MARGARET M., Associate Professor, Nursing.
 STUBBS, G. T., Assistant Professor, Education.
 STURDY, J. A., Clinical Associate Professor, Pathology.
 STURROCK, F. L., Clinical Assistant Professor, Pathology.
 STYRA, DOROTHY G., Instructor, Rehabilitation Medicine.
 SUMNER, M., Lecturer in Piano, Music.
 SUTHERLAND, J. N., Assistant Professor, Education.
 SUTHERLAND, W. H., Clinical Associate Professor, Surgery.
 SUZUKI, D., Associate Professor, Zoology.
 SWAILES, G., Part-time Assistant, Education.
 SWAN, W., Demonstrator, Rehabilitation Medicine.
 SWANSON, C. A., Professor, Mathematics.
 SWANSON, C. O., Honorary Professor, Geology.
 SYED, A., Clinical Instructor, Pathology.
 SYEKLOCHA, DELFA, Lecturer, Microbiology.
 SYKES, P. J., Assistant Professor, Physics.
 SYLVESTER, B., Assistant Professor, English.
 SZASZ, G., Assistant Professor, Preventive Medicine.
 SZIKLAI, O., Associate Professor, Forestry.
- TADYCH, MARY, Assistant Professor, Social Work.
 TALLMAN, W., Associate Professor, English.
 TALNEY, D., Assistant Professor of Music History and Director of the University Choral Union.
 TANTON, B. W., Clinical Assistant Professor, Otolaryngology.
 TARR, H. L. A., Honorary Lecturer, Poultry Science, Zoology.

- TAYLOR, C. P. S., Assistant Professor, Physics.
- TAYLOR, E. I., Instructor, Social Work.
- TAYLOR, F. J. R., Assistant Professor, Oceanography, Botany.
- TAYLOR, G. A., Lecturer, Chemistry.
- TAYLOR, H. E., Professor and Head, Department of Pathology.
- TAYLOR, J. A., Honorary Lecturer in Public Health Administration, Preventive Medicine.
- TAYLOR, J. MARY, Associate Professor, Zoology.
- TAYLOR, P. A., Assistant Professor, English.
- TAYLOR, T. M. C., Professor, Botany.
- TEASDALE, J. MAVIS, Associate Professor, Paediatrics.
- TEES, R. C., Assistant Professor, Psychology.
- TEGHTSOONIAN, E., Professor and Acting Head of the Department, Metallurgy.
- TENER, G. M., Associate Professor, Biochemistry.
- TENNANT, P. R., Assistant Professor, Political Science.
- TERRISS, K. G., Part-time Lecturer, Architecture.
- TEZCAN, S., Associate Professor, Civil Engineering.
- THOMAS, J. C., Clinical Assistant Professor, Psychiatry.
- THOMAS, J. P. W., Clinical Assistant Professor, Medicine. (Clinical Microscopy).
- THOMAS, L. A. J., Associate Professor, Fine Arts, Architecture.
- THOMAS, M. A., Honorary Lecturer, Electrical Engineering.
- THOMASSEN, H., Assistant Professor, Economics.
- THOMPSON, G. B., Clinical Assistant Professor, Surgery (Neurosurgery), Rehabilitation Medicine.
- THOMPSON, R. C., Assistant Professor, Chemistry.
- THOMPSON, R. M., Professor, Mineral Engineering, Geology.
- THOMPSON, W. J., Clinical Assistant Professor, Surgery (Orthopaedics).
- THOMPSON, W. M., Professor, English.
- THOMSON, F. B., Clinical Instructor, Surgery.
- THOMSON, MARY, Instructor, Child Study Centre, Education.
- THOMSON, W., Associate Professor, English.
- THURSTON, H. A., Associate Professor, Mathematics.
- THYER, N. H., Assistant Professor, Physics, Oceanography.
- TICKNER, F., Assistant Professor, Music.
- TIERS, C. A., Assistant Professor, Architecture.
- TIGER, L. S., Assistant Professor, Anthropology.
- TILLEY, ANNE, Assistant Professor, Education.
- TISCHLER, B., Clinical Instructor, Paediatrics.
- TODD, D., Part-time Lecturer, Classics.
- TODD, E. C. E., Professor, Law.
- TOMKINS, G., Associate Professor, Education.
- TOMKINS, MURIEL W., Assistant Professor, Education.
- TOPF, YVONNE A., Clinical Instructor, Psychiatry.
- TOUGAS, G. R., Professor of French, Romance Studies.

- TOWELL, MOLLY E., Assistant Professor, Obstetrics and Gynaecology, Rehabilitation Medicine.
- TOWELL, S., Lecturer, Education.
- TOWERS, G. H. N., Professor and Head, Department of Botany.
- TRACY, C. R., Professor, English.
- TRANT, P., Instructor, Education.
- TRAPP, W. G., Clinical Instructor, Surgery (Thoracic Surgery).
- TRAYNOR, J. A., Clinical Instructor, Medicine.
- TREFFRY, C. J., Clinical Instructor, Paediatrics.
- TREGUNNA, E. B., Assistant Professor, Botany.
- TREIL, C., Assistant Professor of French, Romance Studies.
- TRITES, A. E. W., Clinical Assistant Professor, Pathology.
- TROMANS, D., Research Associate, Metallurgy.
- TROTTER, J., Professor, Chemistry.
- TROWSDALE, C., Associate Professor, Education.
- TRUAX, C. W., Associate Professor and Director of Student Teaching, Education.
- TRUEMAN, G. E., Clinical Instructor, Medicine (Radiology).
- TRYON, MARGARET, Instructor, Child Study Centre, Education.
- TSURUMI, K., Assistant Professor, Asian Studies.
- TUCK, W. D. C., Lecturer, Law.
- TUCKER, F. G., Clinical Instructor, Psychiatry.
- TURKO, M., Clinical Assistant Professor, Obstetrics and Gynaecology.
- TURNBULL, F. A., Clinical Instructor, Surgery (Neurosurgery).
- TURNBULL, I., Instructor, Surgery.
- TURRELL, B. G., Assistant Professor, Physics.
- TURTON, M. R., Teaching Fellow, Paediatrics.
- TURVEY, S. E. C., Honorary Lecturer, History of Medicine and Science.
- TYHURST, J. S., Professor and Head, Department of Psychiatry.
- TYHURST, L., Clinical Assistant Professor, Psychiatry.
- TYSOE, F. W., Clinical Assistant Professor, Obstetrics and Gynaecology.
- UCHIDA, K., Post-Doctoral Fellow, Chemistry.
- UDVARDY, M. D. F., Associate Professor, Zoology.
- UHLER, R. S., Assistant Professor, Economics.
- ULRYCH, T. J., Assistant Professor, Geophysics.
- UNDERWOOD, JOCELYN A., Instructor, Education.
- UPTON, L. F. S., Associate Professor, History.
- VALADARES, J. R. E., Research Associate, Pharmacology.
- VALG, L., Assistant Professor, Forestry.
- VANDERKAMP, J., Assistant Professor, Economics.
- VANDERVAART, R., Lecturer, German.
- VAN GIGCH, J. P., Assistant Professor, Commerce and Business Administration.
- VAN OVERBEEKE, A. P., Post-Doctoral Fellow, Zoology.
- VASSAR, P. S., Professor, Pathology.

- VENABLES, SHIRLEY, Dietitian, Home Economics.
 VERNER, C., Professor, Education and Agricultural Economics.
 VEY, FLORENCE, Assistant Professor, Education.
 VINCE, D. J., Associate Professor, Paediatrics.
 VINCENT, G., Lecturer, Physical Education and Recreation.
 VOGT, E. W., Professor, Physics.
 VOLKOFF, G. M., Professor and Head, Department of Physics.
 VOLKOFF, OLGA, Lecturer, Microbiology.
 VON MEYENFELDT, C. F., Instructor, Physics.
- WADA, J., Associate Professor, Psychiatry (Kinsmen Laboratory for Neurological Research).
 WADE, L., Lecturer, Education.
 WADMAN, H. G., Clinical Instructor, Obstetrics and Gynaecology.
 WAINMAN, A. W., Associate Professor, Slavonic Studies.
 WALCOTT, D. B., Clinical Instructor, Surgery.
 WALDEN, C. C., Honorary Professor, Microbiology.
 WALDIE, A. C., Clinical Instructor, Preventive Medicine.
 WALKER, D. C., Assistant Professor, Chemistry.
 WALKER, J. E., Clinical Assistant Professor, Medicine.
 WALKEY, R. B., Part-time Lecturer, Architecture.
 WALLACE, A. W., Clinical Instructor, Preventive Medicine.
 WALLIS, J. H., Special Lecturer, Geography.
 WALSH, G. C., Clinical Instructor, Medicine.
 WALSH, J., Clinical Instructor, Psychiatry.
 WALTERS, J., Research Forester, Forestry.
 WALTERS, L., Associate Professor, Education.
 WALTERS, M. B., Clinical Instructor, Medicine.
 WALTON, R. C., Assistant Professor, History.
 WARD, D., Assistant Professor, Geography.
 WARREN, A. J., Clinical Assistant Professor, Psychiatry.
 WARREN, H. V., Professor, Geology.
 WARREN, I. H., Associate Professor, Metallurgy.
 WARREN, J. B., Professor, Physics.
 WARREN, J. B., Associate Professor, Commerce and Business Administration.
 WARREN, R. A. J., Assistant Professor, Microbiology.
 WASHINGTON, DOROTHY, Assistant Professor, Education.
 WATANABE, T., Associate Professor, Geophysics, Earth Sciences.
 WATSON, BETH, Lecturer in Voice, Music.
 WATSON, D., Clinical Assistant Professor, Pathology.
 WATSON, E. L., Associate Professor, Agricultural Mechanics.
 WATT, J. G., Clinical Instructor, Orthopaedics.
 WATT, N., Assistant Professor, Education, and Associate Director, Summer Session.

- WEBB, D. L., Post-Doctoral Fellow, Chemistry.
 WEBB, E., Clinical Instructor, Surgery (Anaesthesiology).
 WEBBER, W. A., Associate Professor, Anatomy.
 WEBSTER, D., Assistant Professor, Education.
 WEBSTER, F. A., Assistant Professor, Commerce and Business Administration.
 WEESE, S. A., Instructor, Theatre.
 WEINTRAUB, M., Honorary Lecturer, Microbiology.
 WEISGARBER, E., Associate Professor of Composition and Theory, Music.
 WELLWOOD, R. W., Professor, Forestry.
 WERTS, J. P., Part-time Assistant, Education.
 WESTERMARK, T. I., Assistant Professor, Education.
 WESTPHAL, K. O., Honorary Assistant Professor, Geophysics.
 WESTWICK, R., Associate Professor, Mathematics.
 WHALEY, R. F., Assistant Professor, Education.
 WHEELER, M., Associate Professor, Social Work.
 WHISSON, M. G., Lecturer, Anthropology.
 WHITE, B. L., Associate Professor, Physics.
 WHITE, G. K., Assistant Professor, Mathematics.
 WHITE, P. H., Professor, Commerce and Business Administration, Architecture.
 WHITE, W. H., Professor, Mineral Engineering, Geology.
 WHITEHEAD, L. M., Assistant Professor, English.
 WHITELAW, D. M., Professor, Medicine.
 WHITELAW, J. W., Clinical Professor, Paediatrics.
 WHITINGER, B. R., Associate Professor, Education.
 WHITLEY, P., Part-time Assistant, Education.
 WHITMAN, R. L., Clinical Instructor, Psychiatry.
 WHITTAKER, J. V., Associate Professor, Mathematics.
 WHITTLE, H. D., Professor, Physical Education and Recreation.
 WIENS, MARGARET, Instructor, Nursing.
 WIGHTMAN, B. J., Instructor, Physical Education and Recreation.
 WIGHTON, J. L., Assistant Professor, Mechanical Engineering.
 WIGOD, J. D., Associate Professor, English.
 WILIMOVSKY, N. J., Professor, Zoology, and Director of the Institute of Fisheries.
 WILKINSON, H. C., Associate Professor, Commerce and Business Administration.
 WILL, R. M., Associate Professor, Economics.
 WILLEY, P. A., Lecturer, Physical Education.
 WILLIAMS, CAROL T., Instructor, Education.
 WILLIAMS, D. H., Professor and Head, Continuing Medical Education; Medicine (Dermatology).
 WILLIAMS, D. L., Associate Professor, Physics.
 WILLIAMS, G., Instructor, Slavonic Studies.
 WILLIAMS, L. R., Clinical Assistant Professor, Surgery (Urology).

- WILLIAMS, M. Y., Professor Emeritus, Geology; Honorary Curator of the Museum, Geology.
- WILLIAMS, R. C., Associate Professor, Physics.
- WILLIAMS, UTA, Lecturer, German.
- WILLIAMSON, J. H., Instructor, Physics.
- WILLMOTT, W. E., Associate Professor, Anthropology.
- WILLONER, G., Honorary Lecturer, Electrical Engineering.
- WILSON, E., Assistant Professor of Cello and Music History.
- WILSON, J. R., Clinical Instructor, Psychiatry, Rehabilitation Medicine.
- WILSON, J. W., Professor, Forestry.
- WILSON, J. W., Clinical Instructor, Surgery.
- WILSON, R., Clinical Assistant Professor, Surgery.
- WILSON, R. A., Clinical Associate Professor, Paediatrics.
- WILSON, R. G., Clinical Instructor, Preventive Medicine.
- WILSON, W. M. G., Clinical Instructor, Ophthalmology.
- WINTER, J. H., Associate Professor, History.
- WISEMAN, EVELYN, Instructor, Education.
- WISENTHAL, J., Instructor, English.
- WISNICKI, B. P., Professor, Architecture.
- WISNICKI, CATHERINE, Part-time Lecturer, Architecture.
- WITT, L., Curator, Zoology.
- WOLFORTH, J. R., Instructor, Education.
- WONG, B., Clinical Instructor, Psychiatry.
- WONG, E., Clinical Instructor, Psychiatry.
- WONG, J. M. H., Demonstrator, Paediatrics.
- WONG, L. G. J., Professor, Commerce and Business Administration.
- WONG, R., Assistant Professor, Psychology.
- WOO, JANETTE, Research Assistant, Cancer Research Centre.
- WOOD, BETTY J., Clinical Assistant Professor, Paediatrics.
- WOOD, J. B., Part-time Lecturer, Political Science.
- WOOD, L. G., Clinical Instructor, Surgery (Urology).
- WOOD, W. B., Assistant Professor, Librarianship.
- WOOD, W. S., Clinical Instructor, Medicine (Dermatology).
- WOOD, W. W., Part-time Lecturer, Architecture.
- WOODCOCK, G., Lecturer, English.
- WOODCOCK, T., Part-time Assistant, Education.
- WOODROW, JANICE E., Assistant Professor, Education.
- WOODSWORTH, R. S., Clinical Instructor, Surgery (Anaesthesiology).
- WORT, D. J., Professor, Botany.
- WORTH, ANN J., Clinical Instructor, Pathology.
- WRIGHT, C. S., Lecturer, Geophysics, Earth Sciences.
- WRIGHT, I. G., Post-Doctoral Research Fellow, Chemistry.
- WRIGHT, W. E., Assistant Professor, Political Science.
- WULLSTEIN, L. H., Assistant Professor, Soil Science.

- YAMAMOTO, M., Demonstrator, Pharmacology.
YATES, J. M., Visiting Assistant Professor, Creative Writing.
YEO, D. J., Associate Professor and Head, Department of Public and Community Dental Health, Dentistry.
YORK, D. H., Demonstrator, Physiology.
YOUNG, J. H., Professor, Economics.
YOUNG, J. T., Associate Professor and Assistant to the Director of Secondary Education.
YOUNG, L., Professor, Electrical Engineering.
YOUNG, M. D., Associate Professor, Paediatrics.
YOUNG, M. N., Technical Director and Lecturer, Theatre.
YOUNG, W. A., Clinical Instructor, Medicine, Rehabilitation Medicine.
YOUNG, W. D., Assistant Professor, Political Science; and Assistant to the Dean of the Faculty of Arts.
YOUNGE, EVE R., Part-time Lecturer, Social Work.
YU, Y-N, Professor, Electrical Engineering.
- ZACHARIAS, N. C., Instructor, Pharmacy.
ZACK, J. J., Clinical Instructor, Preventive Medicine.
ZBARSKY, S. H., Professor, Biochemistry.
ZELDOWICZ, H., Clinical Associate Professor, Psychiatry.
ZELDOWICZ, L., Clinical Instructor, Medicine (Neurology).
ZILBER, J., Assistant Professor, Creative Writing.
ZOBEL, F. G. R., Research Associate, Electrical Engineering.
ZWEERS, A. F., Instructor, Slavonic Studies.
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1966-67

GENERAL INFORMATION

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

1966-67

General Information bulletin

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THE UNIVERSITY OF BRITISH COLUMBIA

Historical Sketch

The creation of a university in British Columbia was first advocated in 1877. In 1890 an act of the Provincial Legislature established "The University of British Columbia" but the venture failed for a lack of a quorum at the first meeting of the Senate. In 1908 the earlier act was repealed and a new act established and incorporated the University. The University operated under this act and its amendments as the sole public university in the Province until 1963 at which time a new Universities Act was passed by the Legislature making provision for sister institutions.

The University opened in the autumn of 1915 in temporary quarters on part of the site of the General Hospital in Fairview. At the beginning of the Session 1925-26 the University commenced work on its permanent campus in Point Grey.

The Constitution of the University

The University operates under the authority of the Universities Act of the Province of British Columbia (B.C.R.S. 1963, c52). Following are excerpts from the Act:

" . . . there shall be continued or constituted and established in the Province universities called

- (a) "The University of British Columbia";
- (b) "University of Victoria";
- (c) "Simon Fraser University".

"Each University shall consist of a Chancellor, a Convocation, a Board of Governors, a Senate, a Faculty Council, and the Faculties. Each University shall have in its own right and name the power to grant degrees established in accordance with the provisions of this Act."

"The Convocation of each University shall be composed of: the Chancellor, who shall be Chairman thereof; the President; the members of the Senate; all persons holding academic appointments within the University, whose names are added to the roll of the Convocation upon instructions of the President; all persons who have become graduates of the University; and all persons whose names are added to the roll of the Convocation by regulation of the Senate."

"There shall be a Board of Governors for each University. The Board shall consist of eleven members, comprised of the Chancellor, the President, three members elected by the Senate from its own members, and six members appointed by the Lieutenant-Governor in Council."

"The Senate of each University shall be composed of (a) the Chancellor; (b) the President; (c) the Deans of Faculties and one member of each Faculty elected by the members of that Faculty; (d) such other Deans as may be determined by the Senate; (e) the Librarian; (f) one member to be elected by the governing body of each affiliated college of the University; (g) four members appointed by the Lieutenant-Governor in Council, only one of whom shall be an official of the Department of Education; (h) not less than six nor more than fifteen members, as determined by the Senate, to be elected by Convocation from the members thereof, who shall not be members of the Faculties; (i) one or more members, as determined by the Senate, to be elected by any society or group or organization in the Province which in the opinion of the Senate contributes in a significant way to the

economic or cultural welfare of the Province; and (j) a number of members, equal to the number provided in clauses (g), (h), and (i), to be elected by the Faculties either in joint meeting or in such manner as the Faculties in joint meeting may by regulation determine."

"Each University shall, so far as and to the full extent which its resources from time to time permit, provide (a) instruction in all branches of knowledge as may be recommended by the Senate; (b) facilities for the prosecution of original research in all branches of knowledge recommended by the Senate; (c) fellowships, scholarships, exhibitions, bursaries, prizes, rewards, and pecuniary and other aids to facilitate or encourage proficiency in the subjects taught in the University and also original research in all branches of knowledge; and (d) extra-collegiate and extra-university instruction and teaching and public lecturing as may be recommended by the Senate."

(1) Each University shall be strictly non-sectarian in principle, and no religious creed or dogma shall be inculcated.

(2) No religious test shall be required of any professor, teacher, lecturer, or student or servant of the University, and no religious observance, according to the forms of any particular religious denomination or otherwise, shall be imposed on them or any of them, but the Senate may make regulations touching the moral conduct of the students.

Coat-of-Arms of the University

Argent three Bars wavy Azure issuant from the base of a demi Sun in splendour proper on a Chief of the second an open Book also proper edged strapped and buckled Or inscribed with the words "TUUM EST".

The Session

The academic year begins on the first day of September and ends on the last day of August. The winter session is divided into two terms—the first, September to December; the second, January to May. The summer session consists of seven weeks' instruction in July and August.

COURSES OF STUDY AND DEGREES

The University offers instruction in each of twelve faculties and seven schools. Graduate work is offered by the Faculty of Graduate Studies which also includes the Institutes of Earth Sciences, Fisheries, Oceanography, Industrial Relations.

The degrees offered are as follows:

Agriculture:	Bachelor of Science in Agriculture (B.S.A.)
	Master of Science in Agriculture (M.S.A.)
	Master of Science (M.Sc.)
	Master of Applied Science (M.A.Sc.)
	Doctor of Philosophy (Ph.D.)
Applied Science (Engineering):	Bachelor of Applied Science (B.A.Sc.)
	Master of Applied Science (M.A.Sc.)
	Master of Science (M.Sc.)
	Doctor of Philosophy (Ph.D.)
Architecture:	Bachelor of Architecture (B.Arch.)
	Master of Architecture (M.Arch.)

Arts:	Bachelor of Arts (B.A.) Bachelor of Music (B.Mus.) Master of Music (M.Mus.) Master of Arts (M.A.) Doctor of Philosophy (Ph.D.)
Commerce and Business Administration:	Bachelor of Commerce (B.Com.) Master of Business Administration (M.B.A.)
Dentistry:	Doctor of Dental Medicine (D.M.D.)
Education:	Bachelor of Education (Elementary) (B.Ed.) Bachelor of Education (Secondary) (B.Ed.) Master of Education (M.Ed.) Master of Arts in Education (M.A.) Doctor of Education (Ed.D.)
Forestry:	Bachelor of Science in Forestry (B.S.F.) Master of Forestry (M.F.) Doctor of Philosophy (Ph.D.)
Home Economics:	Bachelor of Home Economics (B.H.E.)
Law:	Bachelor of Laws (LL.B.) Master of Laws (LL.M.)
Librarianship:	Bachelor of Library Science (B.L.S.)
Medicine:	Doctor of Medicine (M.D.) Doctor of Philosophy (Ph.D.)
Music:	<i>see Arts</i>
Nursing:	Bachelor of Science in Nursing (B.S.N.)
Pharmacy:	Bachelor of Science in Pharmacy (B.S.P.) Master of Science in Pharmacy (M.S.P.)
Physical Education and Recreation:	Bachelor of Physical Education (B.P.E.) Master of Physical Education (M.P.E.)
Rehabilitation Medicine:	Bachelor of Science in Rehabilitation (B.S.R.)
Science:	Bachelor of Science (B.Sc.) Master of Science (M.Sc.) Doctor of Philosophy (Ph.D.)
Social Work:	Master of Social Work (M.S.W.)

In addition to the above, courses are offered in the School of Nursing leading to diplomas in Public Health Nursing in Administration of Hospital Nursing Units and in Psychiatric Nursing; in the Faculty of Agriculture to a diploma in Agriculture (Occupational Course); in the Faculty of Applied Science to a Diploma in Surveying; in the Faculty of Education one-year teacher-training programmes, both Elementary and Secondary, are offered in addition to a Diploma in Adult Education and a Diploma in Counselling for Vocational Development.

Honorary Degrees

The degrees of Doctor of Laws (Honoris Causa), Doctor of Science (Honoris Causa) and Doctor of Letters (Honoris Causa) are the honorary degrees conferred from time to time by the Senate of the University upon persons who have achieved distinction in scholarship or public service.

Academic Dress

The undergraduate's gown is black in colour and of the ordinary stuff material, of ankle length, and with long sleeves and the yoke edged with khaki cord. The graduate's gown is the same, without cord.

The colours for the various degrees are:

B.A.	University blue	B.S.N.	scarlet with twisted cord of University blue and white
B.A.Sc.	scarlet	B.S.P.	dark green with cord of scarlet
B.Com.	light grey with black and grey cord	M.S.W.	magenta
B.Ed.	white with cord of University blue	B.Sc.	light blue
B.H.E.	turquoise	B.Arch.	scarlet with white cord
B.L.S.	cadmium yellow	D.M.D.	to be decided
B.Mus.	University blue with cord of alizarin crimson	Ed.D.	to be decided
B.P.E.	malachite green	LL.B.	amethyst violet
B.S.A.	maize	M.D.	scarlet and royal blue
B.S.F.	brown with green cord	Ph.D.	blue and gold

The Master's hood is the same as the Bachelor's, lined with the distinctive colour. The M.B.A. hood conforms similarly to that of the B.Com. The hood for the honorary degree of LL.D. is of scarlet broadcloth lined with dark blue velvet; that for the D.Sc. is the same with dark purple lining; and for the D.Litt., the same with cream lining.

ACADEMIC PROGRAMMES

Individual faculty and school calendars are provided for applicants on request (see last page of this bulletin).

Agriculture

The Faculty of Agriculture offers a wide selection of courses emphasizing the basic and agricultural sciences, with the objective of developing an understanding of the applications of scientific principles to agriculture in students whose aptitudes and interests lie in the natural and social sciences and whose vocational objectives are directed towards scientific research, business and industry, secondary school teaching, or public and private service.

The work of the Faculty is concerned with primary agriculture as exemplified by an understanding of soil, by the growing, protecting, harvesting and marketing of crops and by the care, nutrition and management of animals. As it is also concerned with the processing and marketing of agricultural products, it trains students for industries such as dairying,

meat-packing, fruit and vegetable processing, brewing and wine-making. Another facet of the work of the Faculty is the opportunity afforded students to specialize in basic sciences such as genetics, physiology, nutrition, and pathology, with application directed towards plants and animals, or in biochemistry and microbiology with emphasis on animals, plants and foods. Work is given in pedology and in the application of microbiology, chemistry, physics and mineralogy to soils. Complementary courses in agricultural economics relating to production, prices, marketing and public policy in agriculture are available to those whose challenge lies in the field of economics or rural sociology. A general course in agricultural engineering provides for specialization in agricultural mechanization.

In addition to well-equipped laboratories for research and teaching in various aspects of the basic agricultural sciences, and of the application of engineering and economics to agriculture, the Faculty also has available greenhouses and land as ancillary facilities for undergraduate and graduate studies in agronomy, horticulture, floriculture and plant protection; and supplementary resources for teaching and research with beef and dairy cattle, swine, sheep and poultry.

Undergraduate and graduate plans of study are offered in the following areas:

Agricultural Economics	Dairy Science
Agricultural Economics and Commerce	Agricultural Entomology
Agricultural Engineering	Food Science and Technology
Agricultural Microbiology	Plant Science:
Agriculture and Teaching	Agronomy, Horticulture,
Agriculture and Wild Life Management	Genetics, Nutrition and Plant Protection
Animal Science:	Poultry Science:
Genetics, Nutrition and Physiology	Nutrition, Physiology, Genetics and Processing
	Soil Science

The general undergraduate course covers four academic years and leads to the degree of Bachelor of Science in Agriculture. The curriculum is sufficiently broad and flexible to meet specific needs. Students do not follow a prescribed programme of study but with the help of Faculty advisers, and within the broad requirements for the degree, select majors and electives which will best prepare them for their objectives.

A five-year Honours programme leading to the degree of Bachelor of Science in Agriculture (Honours) is offered in specialized fields of agricultural science.

The Department of Agricultural Engineering offers a five-year programme in the Faculty of Applied Science leading to the degree of Bachelor of Applied Science in Agricultural Engineering.

The various Departments of the Faculty offer, through the Faculty of Graduate Studies, advanced instruction leading to the degree of Master of Science, Master of Science in Agriculture, Master of Applied Science, and Doctor of Philosophy.

In addition to the foregoing the Faculty offers a two-year course for students wishing to proceed with advanced standing to the course for the degree of Veterinary Medicine at the University of Guelph and the University of Saskatchewan, a one-year Diploma Course for young farmers, and, in

cooperation with the Department of University Extension, short courses at irregular intervals to meet the needs of special groups.

Requests for further information regarding the courses available in the Faculty of Agriculture should be addressed to the Dean of Agriculture.

In preparation for admission to the Faculty of Agriculture secondary school students should carry mathematics and chemistry to the Grade 12 level (Mathematics 12 and Chemistry 12); either or both physics and biology should also be taken. A Grade 13 student of British Columbia should take English 100/1, Mathematics 101 or 120, Chemistry 101, one of Physics 101, Zoology 105 and, if necessary, one additional non-science course to give the full programme of five courses.

The occupational course for young farmers is open normally only to residents of British Columbia and does not require matriculation standing.

Applied Science (Engineering)

Engineering studies in the Faculty of Applied Science follow a general pattern in which the first two years are devoted largely to the development of basic concepts in mathematics and physical sciences with some consideration of certain applied fields. In the final two years the work is concerned with application of the sciences in specific areas of engineering.

High standing in courses in mathematics, physics and chemistry, either in a university or by Grade 13, is prerequisite to admission to the Faculty. Practical work outside the University, scheduled field trips, and the activities of professional and technical societies all contribute to the rounding out of an engineering course and the student is expected to participate in them as fully as circumstances permit.

The degree of Bachelor of Applied Science is granted on completion of one of the following courses:

1. Agricultural Engineering
2. Chemical Engineering
3. Civil Engineering
4. Electrical Engineering
5. Geological Engineering
6. Mechanical Engineering
7. Metallurgical Engineering
8. Mineral Engineering
9. Engineering Physics

Extension of engineering studies at the post-graduate level is becoming increasingly important. The Faculty offers post-graduate courses and provides research facilities in many areas of engineering for students proceeding to the degree of Master of Applied Science or Doctor of Philosophy. Acceptance as a candidate for the M.A.Sc. degree requires a high level of accomplishment in the undergraduate course. A substantial programme of academic courses and research, occupying at least twelve months, must be completed to merit this degree. Acceptance as a candidate for the Ph.D. degree requires demonstrated academic and research ability; the programme of studies and research occupies at least two years' resident study following the Master's degree. For both degrees a competence in a second language is expected.

In preparation for admission to the Faculty of Applied Science a secondary school student in British Columbia should include in his studies Chemistry

12, Mathematics 12 and Physics 12. (Where this is not possible a student should take Mathematics 12, one of Chemistry 12 or Physics 12, and an "11" course in Physics or Chemistry.) In Grade 13 the following courses must be taken: English 100/1, Chemistry 101, Mathematics 120, Physics 101, one non-science elective. For direct admission to the Faculty from Grade 13 a student must pass the full programme shown with not less than 60% in each of the mathematics and science examinations.

A student who has completed successfully at least two tri-mesters at Simon Fraser University and has satisfactory standing in the following subjects will be admissible: Mathematics 111, 112, Chemistry 101, 102, 111, 112, Physics 101, 102, two of English 101, 102, 103, 111, and 6 hours of electives. *Satisfactory standing* in general will require at least C in English and the electives, and an average C+ to B- in the other courses. Since these applicants will lack credit for physics laboratory work, each applicant's record will be reviewed carefully by the Admissions Committee to determine eligibility for admission.

Architecture

The architectural course is of three years' duration requiring both academic and practical achievement and follows a sound academic background in the liberal arts. Emphasis is given in the architectural course to the integration of the arts and sciences as a means of stimulating the creative genius of the architect. Admission to the School of Architecture is dependent upon the presentation of evidence of the successful completion of at least three years of study in the Faculty of Arts or Science at this University, or the equivalent in another approved university.

The first degree to be granted is that of Bachelor of Architecture (B.Arch.). It is hoped that the very nature of the study will encourage and prepare students for the pursuit of learning at higher and related levels, for example: urban and regional planning, landscape architecture, and industrial design. In some cases students may undertake research in problems directly concerned with architecture in the related subjects in liberal arts or applied science, or problems of concern to practical building.

The minimum requirement for admission to the School is completion of three years of study in the Faculty of Arts or the Faculty of Science at this University (or the equivalent at another approved university) with an average standing of at least 65 per cent. In the pre-architecture studies English and Mathematics must be taken to the second year university level and Physics to the third year level.

Secondary school students planning a career in Architecture should carry mathematics and science to the Grade 12 level. Grade 13 students should take English 100/1, Mathematics 101 or 120, Physics 101, and two electives, including Chemistry 101 if possible.

Arts

The Faculty of Arts seeks to provide its student body—the largest in the University—with an opportunity to acquire the foundation of a liberal education. By offering studies in breadth as well as in depth, it designedly accords special recognition to the responsibility it shares with the other Faculties to foster in the university student a spirit of free and positive enquiry, a power of critical judgment, and a sensitive capacity for creative expression. Emphasizing such fundamental principles, and choosing its materials of study from the old as well as the new, the Faculty of Arts attempts to prepare the student for both the avocations and the vocations of life. For many professional careers the basic experience of a liberal

education is considered indispensable; in none is it considered superfluous. A specific illustration of its recognized worth may be found in the fact that satisfactory work in the Faculty of Arts is a prerequisite for admission to various professional faculties and schools at the University of British Columbia (e.g. Law, Librarianship, Social Work), and to the Faculty of Graduate Studies in the fields of the Humanities and the Social Sciences.

Departments in the Faculty in which a student may study are: Anthropology and Sociology, Asian Studies, Classics (including Classical Studies, Greek, Latin, Linguistics), Creative Writing, Economics, English, Fine Arts, Geography, German, History, Music, Philosophy, Political Science, Psychology, Religious Studies, Romance Studies (including French, Italian, Spanish, Portuguese), Slavonic Studies (including Polish, Russian), Theatre.

The Faculty offers two routes to the Bachelor of Arts: the Major Programme and the Honours Programme. During their first two years most students take two courses in English, two courses in a foreign language, and at least six electives chosen in accordance with their interests. Before graduating each student takes at least one course in mathematics or the sciences. In the last two years a student in the Major Programme completes five courses in a single field of his choice, two courses outside his special field and three electives; in this way reasonable depth and breadth may be secured. The student who pursues an Honours degree will, during his third and fourth years, study one or two fields in considerable depth and will be required to elect at least two courses more than are required in the General Programme. Those who intend to enter graduate study often select an Honours Programme.

Inevitably, students entering the Faculty of Arts will be confronted by a wide variety of courses and programmes. They should read the *Calendar* of the Faculty with care and, if they need assistance and advice, consult one of the academic or departmental advisers.

In preparation for admission to the Faculty of Arts secondary school students should obtain as strong an academic background as possible in their fields of interest. Students interested in languages should take as many courses in the various languages as their study schedule will allow. For many Departments in the Faculty no special secondary school programme is necessary beyond a wide choice of academic subjects in the University Programme.

For further information see the calendar of the Faculty of Arts.

Commerce and Business Administration

The Faculty of Commerce and Business Administration offers a four-year course of study (following completion of First Year of Arts or Science) leading to the degree of Bachelor of Commerce. It also offers a programme of studies leading to the degree of Master of Business Administration and it is hoped that it may offer further graduate work leading to the doctoral degree in the near future.

It is intended that students who obtain the Bachelor of Commerce degree will on the one hand be familiar with the principles and techniques of those who are dealing most successfully with the varied problems of business—organization, development, control, and social responsibilities and, on the other hand, have the intellectual and cultural background to enable them to deal constructively as business men and citizens with the social, political and legal problems of their times and environment.

The Faculty does not attempt to prepare graduates in the skills and techniques of individual industries or services nor does it expect its graduates to assume immediate managerial responsibilities. It does assume that its gradu-

ates will be well trained in general techniques of business and will be ready to adapt these principles and practices to specific problems. It expects its graduates to display well-disciplined minds and sound work habits.

In accordance with this philosophy the curriculum is organized to ensure a proper blending of regular arts or science courses, business courses, and specialized courses in particular fields in commerce and business administration.

No particular programme of studies in the secondary school is necessary in preparation for admission to the Faculty except that students must take mathematics to the Grade 12 level. In Grade 13 the full five-course programme must include English 100/1 and Mathematics 101 or 120.

Dentistry

The dental programme consists of four years of professional study, leading to the degree of Doctor of Dental Medicine (D.M.D.)

The specific objective of the academic programme is to prepare dentists who will be able to practise their profession with a high degree of technical skill and competence based upon a sound understanding of the fundamental principles of basic biological sciences which underlie the practice of dentistry, and will be possessed of a deep insight into their social, professional and ethical responsibilities to the community at large. It is intended that the graduating dentist shall have the necessary scientific and technological foundation to begin the practice of modern dentistry but not that he should be completely knowledgeable in all phases of dental science and dental art. It is hoped to impart to students the concept that graduation is but a beginning step in their professional education and that this educational process must be continued throughout their professional careers through graduate study, post-graduate and continuing education courses, and programmes of self-study.

Admission to the Faculty of Dentistry is based primarily on academic ability and personal qualities as evidenced by pre-dental scholastic records, aptitude tests, letters of recommendation, and personal interviews. Since facilities for pre-clinical and clinical instruction are limited, enrolment must of necessity be restricted to those who, in the opinion of the Faculty, are best qualified to meet the mental and physical demands of the curriculum and most likely to be able to complete successfully the full course of study. The fulfilment of the minimum requirements for admission should not be regarded as assurance that the applicant will necessarily be accepted.

In preparation for admission to the Faculty of Dentistry secondary school students should carry mathematics, chemistry and physics courses to the Grade 12 level (Mathematics 12, Chemistry 12, Physics 11 or Biology 11). In Grade 13 the following courses should be taken: English 100/1, Mathematics 101 or 120, Chemistry 101, one of Physics 101 or 103, Zoology 105, and one further course of the student's choice. Beyond the Grade 13 or First Year Arts or First Year Science level two further years of study are required as a minimum for admission to the study of dentistry. The only required subject in these final two years of pre-dentistry is Chemistry; Biology 101 must be taken if not completed earlier. An essential requirement is a good academic record with an accumulated average of at least 65% in all courses.

Education

The Faculty of Education provides a basic education for those who wish to become teachers, and advanced education courses for those experienced

teachers who wish to achieve higher qualifications or undertake research. There are complete undergraduate programmes for those who wish to become teachers in nursery schools and kindergartens, in primary and intermediate grades, or in junior and senior secondary schools. There are specialized programmes for those who wish to teach handicapped or retarded children and for those whose interests lie in the field of remedial education. There are additional provisions for specialists in Vocational, Industrial, and Adult Education. Special laboratory classes are available for intensive study of early childhood education, handicapped children, art education, music education, and science education.

This Faculty does not offer any form of initial professional training during the summer or by evening classes. The only method of earning a teacher's certificate is by full-time attendance during a winter session beginning in September of any year. It is considered necessary that all *undergraduates* seeking to become teachers should spend at least two consecutive winter sessions in residence and in the Faculty of Education.

For experienced teachers a wide variety of advanced programmes has been designed for those who wish to specialise in such fields as adult education; pre-school education; guidance and counselling; school administration; school psychology; tests and measurements; comparative education; history, philosophy and sociology of education; elementary education; secondary education. In addition, graduate students may specialise in academic disciplines such as English, Mathematics, Science, Social Studies, Languages, Art and Music as well as in particular educational fields such as programmed learning, audio-visual education, speech education, and special education.

Degrees in Education:

- B.Ed. (Elementary) — requiring four years of University study beyond Grade 12. (Note: Students may go out to teach after two years of University work in the A2 programme, but only on an interim licence. A permanent certificate is awarded only after the completion of three years of University study.)
- B.Ed. (Secondary) — requiring five years of University study beyond Grade 12. (Note: Students must complete the full five years before any certificate is awarded.)
- M.A. (Education) — requiring one full academic year of winter session residence beyond the B.Ed. (Secondary) or two full academic years beyond the B.Ed. (Elementary), the final one of which must be in residence.
- M.Ed. — with similar time requirements as M.A. but without the residence requirement. The degree may be achieved through summer session attendance.
- Ed.D. — requiring two years' full-time residence beyond the M.A. or M.Ed.

In addition to degree programmes for teachers, the Faculty also provides a one-year training programme in either Elementary or Secondary Education for those who have already obtained a University degree in another Faculty. This method of teacher education is not as complete or as satisfactory as the full B.Ed. programme. Students on this programme must take additional courses in order to obtain a permanent certificate or to qualify for admission to the Faculty of Graduate Studies. The academic content of majors in the B.Ed. degree is identical in quantity and quality with that given for B.A. or

B.Sc. degrees. Almost all academic work for the B.Ed. degree is taken with professors in the Faculties of Arts and Science. Professional courses only are given in the Faculty of Education.

No particular programme of studies is necessary in secondary school in preparation for admission to the Faculty but students should anticipate their teaching majors if possible and get a thorough academic background in them. Grade 13 students planning to enrol in the Elementary Division should take History 102; a science is also desirable.

Grade 13 students who have passed four Grade 13 subjects with an average of at least 65% are admissible directly to the undergraduate one-year elementary teacher training course.

Forestry

The profession of forestry offers many opportunities to young Canadians with a general interest in the out-of-doors and a special concern for the management, utilization and conservation of forest and wildland resources. Since 1922, 950 foresters and forest engineers have graduated from the University. Over 90 per cent. of these graduates have remained in Canada and over 80 per cent. in British Columbia. Opportunities for employment of graduate foresters are excellent and salaries compare favorably with those of other professions. Foresters hold many positions of leadership and responsibility in the management, logging, manufacturing, and sales organizations associated with B.C.'s forest industry. A wide variety of employment is available in business, government, research, teaching, consulting, and professional services.

The Faculty of Forestry offers a four-year course, following Grade 13 or First Year Arts or Science, which leads towards the Bachelor of Science in Forestry (B.S.F.) degree and is designed to educate students interested in professional careers in forestry.

As an undergraduate the student in forestry will find ample opportunity for profitable summer employment either with private industry or with various Federal and Provincial forest agencies. He should be able to earn sufficient money to defray most of his University expenses. Summer employment in the field or manufacturing plant is considered to be an integral part of the student's training.

As an undergraduate, the student must attend three field-periods of instruction on the University's 10,000 acre Research Forest; one period of 10-field days preceding second year, 6-field days preceding third year, a period of 21-field days at the end of the third year.

The course in Forestry is arranged to provide basic knowledge of the sciences and their application to forestry problems. The course is divided into two main groups—the technical group and the biological group. Each group comprises four sub-groups or options. The technical group of options deals with the management of forest land, the techniques of growing, measuring, and harvesting of forest crops, and the manufacture and sale of forest products. The biological group of options is concerned with the many factors affecting the growth and health of trees and timber stands, and the relationship of forests to their environment. The biological options are specially concerned with all aspects of tree and forest research. Each option is planned to either facilitate post-graduate education or to provide the basic knowledge and skills needed for employment with industry or Government agencies.

Students from any option are eligible for registration in the Association of British Columbia Foresters after two years of experience following graduation.

Graduate programmes leading to the M.F. degree in all fields and to the Ph.D. degree in basic or scientific aspects of forestry and forest products are offered through the Faculty of Graduate Studies.

In preparation for admission to the Faculty students in secondary school should elect a Sciences specialty. Grade 13 students should take English 100/1, Mathematics 101 or 120, Chemistry 101, Physics 101, and one elective.

Home Economics

The School of Home Economics was established as a Department in the Faculty of Arts and Science in 1943. While thought of as a field for women, the expanding breadth and responsibilities of professional openings for graduates in Home Economics are attracting both young men and women.

The objective of the School is to provide an education that will prepare a graduate to enter a profession and at the same time to fill more effectively a place in the community. The professions which home economics graduates enter are related, directly or indirectly, to homes and individuals. Home economists become teachers in secondary schools and universities; nutritionists in provincial and city health services; dietitians in hospitals, college residences and commercial establishments; Extension workers concerned with education in non-urban areas; and in promotion, research and consumer education with federal departments, utility companies, primary producers and food manufacturers; and some find interesting positions in television, interior design, textiles and clothing. Many graduates have been able to combine successfully both homemaking and a career. Other homemakers choose to use their knowledge and experience in voluntary community services. Those graduates who have proceeded to higher degrees have found their services in even greater demand and have the opportunity of accepting more challenging positions.

The School of Home Economics has two principal programmes: the Bachelor of Home Economics degree may be earned in four years from Grade 12, while the Honours Bachelor of Home Economics degree requires five years. The latter programme prepares a graduate more effectively for specialization at the graduate level.

In the four-year programme, approximately 50% of the time is spent in Home Economics subjects, and 50% in supporting courses in the Departments of Chemistry, Economics, English, Microbiology, Psychology and Zoology. In the five-year programme greater weight is given to pure sciences, social sciences and individual investigation. Regardless of the line of professional interest a student may choose, the first two years of the B.H.E. degree programme and the first year of the Honours B.H.E. programme are uniform in requirements. Specialization and professional preparation follow.

The School of Home Economics is housed in its own building which has facilities for both academic and student activities. The student group is closely knit, cooperative and anxious to make newcomers feel at home. In addition, students are assigned to faculty advisers who assist with programme planning and selection of electives. An appointment for a conference with a faculty member may be made before registration.

In preparation for admission to the School of Home Economics students in secondary school are advised to present a major in Home Economics and, if possible, to take Physics 11. Students without previous studies in Home Economics or in physics are admissible to the programme, however all students must have completed both Chemistry 11 (and Chemistry 12 if possible), and Mathematics 12. Grade 13 students should take English 100/1, Chemistry 101, Mathematics 101 or 120, Zoology 105 (Biology 100 is acceptable) and one elective. Students who complete Physics 11 are not required to take any further physics course.

Law

The Faculty of Law prepares students for admission to the practice of law and for business and government service. Study in the Faculty leading to the Bachelor of Laws (LL.B.) degree covers three full winter sessions.

The minimum requirement for admission to the Faculty is completion of the first three years of a Bachelor of Arts degree programme with an average of 65% in the Third Year. Most students obtain the B.A. degree or a bachelor's degree in another Faculty before seeking admission to the study of law.

A combined course in Commerce and Law is provided which leads to both the B.Com. and the LL.B. degrees. This programme consists of three years in the Faculty of Commerce and Business Administration followed by the three-year course in Law, i.e. a total of seven years following Grade 12.

No special curriculum need be followed by secondary school students who plan to enter the Faculty of Law.

Librarianship

The School of Librarianship offers a one-year post-graduate programme leading to the degree of B.L.S. (Bachelor of Library Science).

Libraries today are a fundamental part of the educational process; they are a basic resource for formal education at all levels, the chief means of self-education, and indispensable for scholarship and research. The task of librarians is to raise the value of print to its highest power. Librarians promote reading by making available a wide selection of materials; by organizing and describing the collections so as to facilitate their use; by stimulating and guiding reading for pleasure; by assisting and participating in the many-sided pursuit of information. Librarians must know and appreciate books and they must know how to make books effective.

The purpose of the School of Librarianship is to give a selected group of university graduates the understanding, motivation, skills and knowledge to make libraries most useful to our society and thus promote the ends which reading serves.

The teaching programme of the School, while not ignoring the need for instruction in the technical aspects of librarianship, gives chief emphasis to developing in its students the understanding, motivation and bibliographical knowledge by which to make libraries most useful to our society. A close knowledge of books and the sources of information for their effective use is the primary aim, and a semi-tutorial approach, by which faculty members work closely with students in small groups, is the basic teaching method.

A reading knowledge of foreign languages is useful in all areas of library work and essential in many. Students are advised to acquire a working knowledge of at least two foreign languages, preferably French, German, Russian, or Latin.

No special curriculum need be followed by students in secondary school who plan to enter the School of Librarianship.

Medicine

The Faculty of Medicine provides the basic training of students who wish to find their employment in one of the many fields of medicine.

Careers in clinical medicine include general practice and the specialties. General practice has an unlimited scope and the physician is free to make of it what he wishes. However, the successful general practitioner is usually one who serves as the "family physician" in a community. The specialties

are so varied that one can be found to suit any personality or temperament. Because of the wide selection of careers in clinical medicine, a pre-medical student need not worry whether he will be suited for a particular field of medicine. If in the course of his training he discovers a preference for one branch of clinical medicine, he can plan a career in this field.

Careers which do not involve care of patients are too numerous to list, but most of them can be classified as teaching, research or administrative careers. Opportunities are excellent for a physician who wishes to follow an academic career. Medical schools are growing so rapidly that not enough qualified physicians can be found to fill the available positions. Teaching positions in the basic medical sciences are open to graduates with either a Ph.D. or M.D. degree. In Canada, most medical research is carried out by teachers in medical schools and the teaching hospitals. Most members of medical school departments are actively engaged in research programmes. Careers which are predominantly administrative are to be found in the university, the hospital, government and industry. Many are closely associated with clinical medicine and include public health, hospital administration, insurance medicine, industrial medicine, military medicine, aviation medicine, space medicine, etc. Opportunities are increasing in all these fields for physicians with special interests and talents.

A physician's education can be divided into four phases: (i) pre-medical preparation (minimum 3 years, beyond Grade 12, High School Graduation); (ii) medical school training (4 years); (iii) interne training (minimum 1 year) and specialization (minimum 4 years); (iv) continuing education.

In the pre-medical years in the Faculty of Arts or the Faculty of Science the student should develop scholarly talents and acquire a broad education. He must demonstrate to himself and to the medical school that he is an efficient scholar and is likely to master the courses which lie ahead.

In preparation for pre-medical studies a student in secondary school should take Chemistry 12, Mathematics 12 and Physics 11. In Grade 13 the following courses should be taken: English 100/1, Chemistry 101, Mathematics 101 or 120, Physics 101 or Zoology 105, one elective.

Nursing

The School of Nursing offers a programme designed to enable students to become competent professional nurses, capable of participating with other individuals and groups in providing comprehensive health services.

Completion of prescribed courses at first year university level is required for admission. The four-year programme combines the study of general Arts and Science subjects with the special preparation needed to equip the individual for the practice of professional nursing. Upon satisfactory completion of the programme students are granted the degree of Bachelor of Science in Nursing (B.S.N.), are eligible to write Registered Nurse examinations, and are prepared for the practice of nursing in both the hospital and public health fields.

Through appropriate experience individuals with ability can progress from staff level positions to those of assistant head nurse, head nurse, or teacher on a nursing school faculty, and in the public health field to positions of senior nurse or supervisor.

In preparation for admission to the study of Nursing, secondary school students should include Chemistry 12 (at least 11), Mathematics 12 and, if possible, Biology 11 or 12 in their Secondary School Graduation programmes. Grade 13 students will require English 100/1, Chemistry 101, Mathematics 101 or 120, Zoology 105 or Biology 100 and a non-science elective; standing

required is at least 60 per cent. in either Chemistry or Zoology (or Biology) or, in lieu of this, an overall average of at least 60 per cent.

Pharmacy

Pharmacy is that profession which is concerned with the art and science of preparing from natural and synthetic sources suitable and convenient materials for distribution and use in the treatment and prevention of disease. It embraces a knowledge of the identification, selection, pharmacologic action, preservation, combination, analysis, and standardization of drugs and medicines. It also includes their proper and safe distribution whether dispensed on the prescription of a licensed physician, dentist or veterinarian or, in those instances where it may legally be done, dispensed or sold directly to the consumer.

The minimum requirement for the degree of Bachelor of Science in Pharmacy is four years of academic training beyond the Grade 13 level. This programme for Pharmacy is the standard agreed upon by the Canadian Conference of Pharmaceutical Faculties. The curriculum in Pharmacy has been designed to provide a core of required subjects comprising the necessary basic sciences and an amount of professional orientation and technology which will enable all graduates to function as competent pharmacists. Since graduates in pharmacy may find employment not only in retail pharmacy but also in hospital pharmacy, pharmaceutical sales and promotion, industrial pharmacy and in other fields, elective courses are provided which will enable the student to enlarge his understanding of and preparation for the branch of pharmacy in which he intends to work.

Secondary School students contemplating admission to the Faculty of Pharmacy should by the end of Grade 12 have completed Chemistry 12 (at least 11), Mathematics 12 and, if possible, Physics 11 or Biology 11. Grade 13 students must have: English 100/1, Mathematics 120 or 101, Chemistry 101, Physics 101 or Zoology 105 (or Biology 100), and one non-science elective.

Physical Education and Recreation

The School of Physical Education and Recreation provides opportunity for study leading to the bachelor's and the master's degrees in physical education. Undergraduates are required to have a major in a second subject suitable for teaching in the secondary schools. Many graduates teach in the secondary and the elementary schools of the province; others find opportunities for employment in recreation and physical education in community centres, Y.M.C.A. and similar organizations.

Students who wish to prepare specifically for a career in recreation should enrol for the B.P.E. degree on the Programme for Specialization in Recreation.

Students may also study toward the Bachelor of Education degree with specialization in physical education and in an academic subject.

Secondary school students, who plan to enrol for the B.P.E. degree (with specialization in Physical Education), should take Mathematics 12 and Chemistry 12 (at least 11), and if they take Grade 13 should choose English 100/1, Chemistry 101, Mathematics 101 or 120, and two further courses, including Zoology 105 if possible.

Rehabilitation Medicine (Physical and Occupational Therapy)

The course offered at the School of Rehabilitation Medicine is combined training in physical and occupational therapy. The purpose of this course is to provide basic knowledge and technical skills required to practise these therapies.

The rehabilitative aspects of medical treatment become more important as the profession of medicine moves farther into the field of chronic care. Increased recognition by physicians and patients of the value of the therapist's work has led to greater use of remedial treatment and remedial work techniques at all levels of care, acute as well as chronic. As the practising physician is asked to take more responsibility for these community services, it becomes apparent that he will require competent assistants. The present combined course in physical and occupational therapy is medically orientated to produce a well-qualified therapist who can fill an increasingly important role as the third member of the medical treatment team at hospital, rehabilitation centre, outpatient and home level, along with the nurse and physician. It is anticipated that increased interest in this field will place all branches of therapy in a more prominent position and create many more opportunities for those wishing to avail themselves of this training.

In preparation for admission to the School, secondary school students should include in their studies Chemistry 12 (at least 11), Mathematics 12, and, if possible, Physics 11 or 12. Grade 13 students should take English 100/1, Mathematics 101 or 120, Chemistry 101, Zoology 105 (or Biology 100 if Zoology 105 is not available) and one elective course.

Science

The Faculty of Science consists of several departments; a general description of the studies offered in these departments is given below. Opportunities are offered for study to the bachelor's, master's and doctor's degrees.

Secondary school students should prepare themselves for admission to the Faculty of Science by presenting majors in mathematics and science for Secondary School graduation; the following courses should be taken: Chemistry 12 (at least 11), Mathematics 12, Physics 11 or 12 and, if possible, Biology 11. Grade 13 students should take English 100/1, Mathematics 120, Chemistry 101, Physics 101 and one course from: Biology 100, Botany 105, Zoology 105. (Biology 12 should be taken as an extra in Grade 13, if possible, if one of these other courses is not available.)

Chemistry: offers undergraduate training to chemistry specialists in an Honours programme and also in a Major programme; students wanting a less intensive background may take a general programme.

The Honours B.Sc. programme is a four-year course, with emphasis in the last three years on all branches of chemistry, and with mathematics and physics as ancillary subjects. It is intended to serve primarily as a basis for graduate work leading to the M.Sc. and Ph.D. degrees. The B.Sc. Major in chemistry includes many of the courses prescribed for Honours, but differs from Honours in having more electives in the course requirements of the final year, and in not requiring as high a standing of achievement. It provides full professional qualification in chemistry and is intended for persons seeking employment at the B.Sc. level in industry, Government research laboratories or in education as teachers of secondary school chemistry. Graduates of this programme, with appropriate standing, will be eligible for admission to graduate work.

Geology: offers programmes following the Honours, Major and General course as outlined in the Faculty of Science calendar. Practical field experience is essential and is provided by a Field Geology course and summer work, usually found with the government surveys and mining and oil companies.

Specialization in Geology is also possible by taking the Geological Engineering course in the Faculty of Applied Science. This course is especially suitable for students intending to work for the mining industry.

Secondary school students should elect mathematics and sciences as majors toward Graduation, including Mathematics 12, Chemistry 12 (at least 11) and Physics 11 or 12. Grade 13 students should take English 100/1, Chemistry 101, Mathematics 120, Physics 101, and one elective. Students in First Year Science should take Geology 105 if they wish to specialize in geology; Grade 13 students who wish to take either the Honours or the Major programme will take Geology 105 in the Second Year and will follow a special course sequence worked out in consultation with advisors of the Department of Geology.

Geophysics: is a very broad subject which is concerned with the use of techniques in physics to study the nature and history of the Earth and its relationship with the solar system. It has practical applications such as prospecting for oil and minerals through the use of seismology, gravity and magnetism, and also covers a number of more fundamental fields. These include meteorology, exploring the upper atmosphere with rockets and satellites, determining the age of the Earth and its geological features, and the thermal history of the Earth and other objects in the solar system. For some of these studies some background in geology is desirable, while for others chemistry or mathematics is more useful. In any case a reasonably strong background in physics is essential.

Three programmes are offered in the Department of Geophysics: Major in Geophysics, Combined Honours in Geophysics and Physics, and Combined Honours in Geophysics and Geology. The first programme provides a thorough basic introduction in geophysics, physics and geology, while the latter programmes provide a more intensive training in two of the three subjects.

In addition, a Geophysics option is available to students in the Applied Science Faculty enrolled in Geological Engineering.

Life Sciences:

Biochemistry: is a scientific discipline which is concerned with the determination of the nature of chemical transformations within cells and tissues and the understanding of mechanisms by which chemical energy is transformed into useful work. Studies in biochemistry are concerned with the chemical substances needed to maintain life and growth, the biochemistry of reproduction and heredity and special problems of special tissues. Students contemplating careers as biochemists are advised that a good foundation in chemistry and biology is needed. The Honours and Major programmes leading to the B.Sc. degree have been designed to provide this training. The major programme can lead to technical positions in various types of research institutes and departments and the Honours course is planned to lead into post-graduate study.

Biology is not treated as a department but as a field of study. Programmes are sponsored and instruction is offered cooperatively by the Departments of Biochemistry, Botany, Microbiology, Physiology and Zoology in courses in the Principles of Biology, Biometrics, Cell Physiology, Cytology, Ecology and Genetics. Students wishing to continue on a graduate programme in Biology should consult with the Life Science department or departments most appropriate to the field of specialization. In special cases inter-departmental graduate programmes can be arranged.

Botany: Honours, major and general course programmes are available. The Honours course, covering a wide range of experimental and descriptive courses in botanical and biological subjects, is designed primarily to lead to post-graduate study. Courses in anatomy, biochemistry, cytology, ecology, genetics, morphology, mycology, phycology, physiology and taxonomy form part of this

programme. Students with an interest in an experimental approach to the study of plants are encouraged to include a larger number of courses in mathematics, physics and chemistry in their programmes. The Major course programme is suitable for those intending to teach either Botany or Biology in schools or for those intending to work in government laboratories, research institutes or museums. The general course is designed for those wishing to obtain a broad background in science.

Microbiology: embodies the study of bacteria yeasts, molds and viruses. These studies are concerned with public health aspects, industrial applications and the biochemistry and genetics of microorganisms. The techniques and concepts learned through a study of microorganisms are of very general use to students in such fields as chemistry, the biological sciences, the medical sciences and home economics.

Physiology is a broad scientific discipline concerned with the normal function of living organisms. Certain aspects of the subject are therefore closely related to the interests of other Departments—Bacteriology (microbial physiology), Botany (plant physiology) and Zoology (comparative physiology). The Department of Physiology offers an Honours programme leading to the B.Sc. degree, in which emphasis is placed upon the physiology of vertebrate, and especially mammalian, organisms. The course of study includes intensive consideration of the general properties of living cells and of the individual organ systems of body and their control by the nervous system and by the endocrine organs. The programme is intended primarily to prepare the student for future graduate and research study.

Zoology: concerns itself with the scientific study of all aspects of animal life: classification; the structure or anatomy of animal forms; their behaviour; their relationships with the environment; the chemistry and physics of animal function; the nature of their populations; the detailed anatomy of their cells and the molecular details of cell contents.

Many students will undertake several courses in zoology to prepare themselves for entry into such applied fields of human activity as medicine, dentistry, home economics, agriculture, or physical education. Others may wish to enter one of the zoological professions among which will be Fisheries Biology and Management; Forest Entomology, Agricultural Entomology, Parasitology and Wildlife Management Biology. Still other students will elect to study zoology for its intrinsic interest as a scientific discipline or to prepare themselves to undertake research or to teach zoology in universities or secondary schools.

General courses offered provide study in the structure and function of vertebrate and invertebrate animals, organ physiology, animal ecology, genetics and the philosophy and history of zoology.

Beyond these introductory programmes the department offers many undergraduate courses of a more specialized nature, such as the Biology of Vertebrate Animals, Biology of Fishes, Parasitology, Entomology, Embryology, Experimental Zoology, Animal Behaviour and Genetics.

The department maintains large research collections of insects, animal parasites, fishes, marine invertebrates, mammals and birds. It has its own experimental Aquarium with both fresh and salt water facilities, its own small research boats and access to the larger vessels of the Institute of Oceanography and the Fisheries Research Board. The Department has made a special feature of marine study and research, much of which is centred in the Institute of Fisheries.

The Department has unique facilities for research with large and small wild mammals and birds. Special equipment available for this work includes a Vivarium, animal behaviour theatres, and thermoregulated respirometers

that will measure the use of energy by animals from mice to deer.

In the more detailed areas of study the physiological laboratories are equipped with the most modern instruments for study of, and research in, either the chemical and physical functions of whole animals, or single cells. *Mathematics*: offers Honours and Major programmes in both the Faculty of Science and the Faculty of Arts. Students who plan to combine the study of mathematics primarily with that of physics, chemistry or other sciences should register in the Faculty of Science. Those who plan to combine mathematics with economics, philosophy, or other Arts subjects should register in the Faculty of Arts.

The Honours programme in mathematics, whether taken in the Science or Arts Faculty, is intended primarily for students who plan a career in mathematics or its applications. Such a career, whether in industry, government agency or in the academic field, normally requires graduate study to the master's or to the doctoral level. The Honours course is therefore designed primarily to equip students for graduate study in mathematics.

The mathematics major in the Faculty of Science provides a moderately intensive training in mathematics, but is less specialized than the Honours course. Graduates of this programme will be well qualified for teaching mathematics in secondary schools or for jobs in business, industry, or government agencies that require some knowledge of mathematics but not advanced degrees. It is expected that the better graduates of the major programme will continue with graduate work in mathematics.

The mathematics major in the Faculty of Arts provides a less intensive training than the mathematics major in the Faculty of Science. It provides the minimum training recommended for prospective mathematics teachers in the secondary schools.

Secondary School students wishing to take any mathematics course at the University must take Mathematics 12.

Physics: offers courses leading to the B.Sc. degree (Honours, Major and General) described in the Faculty of Science calendar and to the B.A.Sc. degree in Engineering Physics described in the Applied Science calendar. Most of the graduates in the Honours course, many Engineering Physics graduates, and some Majors continue with graduate work leading to the Master's and the Ph.D. degrees. This is becoming even more necessary and customary as preparation for a professional career in government, industrial or academic research. Financial aid for graduate studies is available from University and other sources for students with good records. Students who do not plan to go on for graduate work prepare themselves either for a career as secondary school teachers or seek employment in industry or in government departments such as the Meteorological Service. The general degree provides a broad general education, but does not lead to a professional career in science.

Social Work

The School of Social Work offers work leading to the degree of M.S.W. The School is accredited by the Council on Social Work Education, the authorized professional accrediting body for graduate social work education.

The accepted education for the profession of social work consists of a minimum of two university years of graduate study including lectures, clinical practice work in the field, and a research project or thesis, leading to the degree of Master of Social Work. The total course is designed to give a broad preparation for the field of social work and to develop skill in one or more fields of practice.

Requirements for entrance to the School are as follows:

- (a) The Bachelor of Arts degree, or an equivalent, from a recognized university. An emphasis on the humanities, the social and the biological sciences is preferred.
- (b) Personal qualifications for the field of social work. Because maturity is an important factor, students are usually advised to wait until they are at least 21 years of age before beginning their professional education.

It is recommended that in the First and Second Years of University undergraduates select for their electives as many introductory courses in the social and biological sciences as possible. Third and Fourth Year courses which are particularly likely to be suitable for undergraduates proceeding to social work are anthropology, economics, political science, psychology and sociology. Other suggested areas of study include biology, history, international studies, slavonic studies, geography, community planning, literature, drama and music.

No special programme of studies in secondary school need be followed to prepare a student for admission to Social Work. A suggested Grade 13 course is English 100/1, History 101 or 102 or both, Biology 100 or Zoology 105, and electives to make up a full programme of studies.

ADMISSION REQUIREMENTS

All enquiries relating to admission to the University should be addressed to: The Registrar, The University of British Columbia, Vancouver 8, B.C., Canada.

Applicants seeking admission to the School of Nursing should write directly to the Director of the School instead of to the Registrar.

The following regulations notwithstanding, the University reserves the right to reject applicants for admission on the basis of their overall academic records even if they technically meet entrance requirements.

A. Graduates of British Columbia Secondary Schools:

The minimum academic qualification for admission to the University is Secondary School Graduation (University Programme). This programme is approved by the Senate of the University for the purpose and is administered by the Board of Examiners of the Province on which are representatives of both the University and the Department of Education. Enquiries relating to Secondary School Graduation or to the Grade 12 and Grade 13 examinations should be addressed to the Executive Secretary of the Board of Examiners, Department of Education, Victoria, B.C.

1. Admission from Grade 12

An applicant will be admitted who:

- (a) is fully recommended by an accredited secondary school on first attempt in Grade 12
- or (b) obtains an average of 60% or better on first attempt in a full set of examinations conducted by the Department of Education. The minimum full set of examinations would consist of English 40, and the terminal examinations in three major subjects,
- or (c) has a secondary school record that, although it does not meet the standards required in (a) or (b) above, is considered by the Admissions Committee to give promise of success in university studies.

The average is calculated on four marks by considering English 40, and the highest marks of three majors. The mark for a Science major is taken

as the mean of the top two "91" courses comprising the major.

Where there is need to compare letter grades with percentages, the following equivalences will be used: A—86%; B—73%; C+—67%; C—60%.

A Grade 12 student who passes one or two Grade 13 subjects may, if the standing obtained is sufficiently high, be granted advanced placement in this subject or subjects on registration at the University, but no advance credit will be assigned, i.e., his university programme will not be shortened thereby.

Statement on admission of graduates of the senior secondary schools of British Columbia, effective September 1967.

The minimum academic qualification for admission to the University is graduation from Senior Secondary School with a programme specialty in one of Arts, Sciences, Technical.

The University reserves the right to select from among qualified applicants those who will be admitted.

The University reserves the right to require additional study time of those admitted whose previous studies are inappropriate to the programme to be taken at University.

Applicants seeking admission to the Faculty of Science or to any study programme involving chemistry are advised to plan a school programme to include Chemistry 12, Mathematics 12, and Physics 11, or, alternatively, Mathematics 12, Physics 12 and Chemistry 11; Biology 11 will also be useful. Applicants seeking admission to Agriculture, the Biological or Medical Sciences will find Biology 12 of value. Courses that include the study of chemistry are: Agriculture, Applied Science, Architecture, Dentistry, Forestry, Home Economics, Medicine, Nursing, Pharmacy, Physical Education, Rehabilitation Medicine and Science.

Graduates in the Arts or Sciences specialties will be required to have a second language to the "11" level. Graduates in a Technical specialty must have credit for a second language to the "10" level. University courses in French will in general anticipate a background to the "11" level.

2. Admission from Grade 13

An applicant who has completed Grade 13 of this province may be given credit for subjects passed that are appropriate to his objective subject to the following conditions:

- (i) that at least three subjects be passed at one sitting of the Grade 13 Departmental examinations;
- (ii) that a full programme of at least five Grade 13 subjects be presented if the applicant cannot qualify under (i).

A Grade 13 student who fails to obtain passes in at least three subjects at one examination period will be required to complete successfully the full Grade 13 programme of at least five subjects before his application for admission to the University can be considered.

A student once having been admitted to the University shall be subject to the University regulations in respect of supplemental examination privileges and may not obtain standing for subjects subsequently completed by way of Grade 13 Departmental examinations and thereby circumvent these regulations.

A student may not receive credit for subjects taken through Grade 13 examinations after he has been granted 15 units of course credit either as advanced standing on admission to the University or through completion of university courses or a combination of these.

B. Graduates of Secondary Schools outside British Columbia:

The minimum academic qualification for admission to the University of

applicants from outside British Columbia is Senior Matriculation (equivalent level of Grade 13, British Columbia), provided that the subject-matter and standing obtained, in addition to meeting University requirements, meet the entrance requirements of the applicants' own national or provincial universities.

Admission will be limited to applicants with good academic records. All applications are considered on an individual basis. Applicants from other Canadian provinces should not anticipate acceptance if their average standing on senior matriculation is less than 5% above the minimum standing required by their own provincial universities.

Applicants seeking admission to programmes of study in science (pure or applied) should have taken a course in calculus during or subsequent to Senior Matriculation.

A candidate who wishes to enter by certificate other than that issued by the Department of Education, British Columbia, should submit the original documents to the Registrar. He should not come to the University without having first obtained from the Registrar a statement of the value of the certificates he holds.

Unless the applicant's diploma or certificate shows the gradings obtained in the several subjects of the work taken, he must arrange to have a statement of his grades sent to the Registrar by the educational body issuing the diploma or certificate.

Original certificates will be permanently retained by the University unless accompanied by copies or unless the candidate pays the prescribed fee for making copies.

1. Applicants from other Canadian provinces

Alberta, Saskatchewan, Manitoba, Nova Scotia, Newfoundland—Grade 12
—a language other than English is required to the Grade 12 level.

Ontario, New Brunswick—Grade 13

Quebec—McGill Senior School Certificate or equivalent.

Prince Edward Island—third year certificate from Prince of Wales College or equivalent.

2. Applicants from other countries (see Section E, below)

- (i) General Certificate of Education (G.C.E.)
—standing in five subjects including English, a second language, mathematics, a laboratory science, and one academic elective, of which at least three must be at the Advanced (A) Level. At both Ordinary and Advanced Level an average grade of "3" with no subject below "4".
- (ii) School Certificate—as for the G.C.E. (i) above with three passes at the Principal Level on the Higher School Certificate.
- (iii) University of Hong Kong Matriculation Certificate—standing equivalent to (i) above.
- (iv) Certificate of Matriculation of recognized universities.
- (v) High School Graduation and completion of at least one full year of study at an accredited college or university in the United States of America. Grade average of "B" or better. High School studies to include at least: 7 semesters of English, 4 semesters in one foreign language, 4 semesters laboratory science, 6 semesters mathematics. College or university studies to permit acceptance at the University of British Columbia at the sophomore level.
- (vi) Students from India must, as a minimum requirement, possess a bachelor's degree, division I.

Note: Applicants whose homes are in British Columbia will be considered on the same basis as applicants from this province. This policy applies to students who, subsequent to High School Graduation, become domiciled in British Columbia.

C. Applicants for Advanced Undergraduate Standing:

An applicant who has completed work at another university or college, or has the equivalent of senior matriculation taken outside British Columbia, may be given credit for subjects previously passed provided they are equivalent to courses offered in the University curriculum, are of sufficiently high standing, and are appropriate to the programme elected by the applicant. Such advanced standing will be tentative only and is subject to review after the student has completed one or more sessions at the University.

The previous statement applies to applicants for transfer from other British Columbia universities or from colleges in this province. Applicants applying for programmes of study not offered at their own institutions will be considered on the same basis as students from the University of British Columbia. Students transferring may not be granted credit for courses in which they obtained the minimum passing grades; moreover, a student with an over-all weak record at another institution will not normally be permitted to transfer to the University of British Columbia.

Students planning to complete their preliminary studies at another institution should verify that the proposed studies are fully acceptable to permit the transfer. For example, some difficulty will be experienced by students who complete *pre-engineering* studies at Simon Fraser University because of the lack of laboratory work in Physics in the first two trimesters; adjustments can be made in situations such as this but prospective students should avoid such difficulties by making full and adequate enquiries before beginning their preliminary studies.

Advance credit granted in a degree programme is limited and may not normally be applied to the final two years of the programme. A student may not receive credit for subjects taken at a junior college after he has been granted 30 units of course credit either as advanced standing or through a combination of transfer and University credit.

Except where specifically stated otherwise in the regulations of a particular faculty or school a student may not receive a degree unless he completes the equivalent of two winter sessions in attendance at the University, one of which must be the final year.

D. Applicants for Graduate Studies:

The minimum requirement for admission to the Faculty of Graduate Studies is graduation with a bachelor's degree in an honours programme or the equivalent. Applicants with acceptable standing who do not have the equivalent of an honours degree may be accepted as provisional graduate students to permit them to make up any deficiencies in their academic background.

For details on admission requirements see the calendar of the Faculty of Graduate Studies.

E. Students from Other Countries:

A student from a country where English is not the common language must satisfy the Registrar that his knowledge of English is adequate to permit the successful pursuit of his studies.

All foreign students, and students who have not matriculated from a high school where English is the language of instruction, shall report for screening

tests on the Friday preceding the week of registration; students who fail so to report may be denied admission to the University. No such student shall be allowed to register before he has taken the screening test.

The Committee in charge of the preparatory English classes shall, upon reading the screening tests, recommend as to the student's admission and to the level and number of courses in which registration should be permitted. A student for whom the preparatory English course is prescribed must attend classes in this subject regularly if he wishes to continue with his University course. He will be admitted to the credit courses in English and certain other subjects only after he has achieved reasonable competence in the work of the preparatory classes.

A student must enrol for the course to which he has been admitted. Transfer to another programme will not be considered until the person concerned has completed at least one session in the course for which he was admitted to this University.

A person from overseas, who has been admitted to a university or college in Canada or the United States, will not be permitted to transfer to this University until he has obtained a baccalaureate degree.

A student coming directly from another country must give satisfactory evidence of his ability to meet the costs of tuition, board and room, books and incidentals.

F. Limitation of Attendance:

(a) The University reserves the right to limit attendance, and to limit the registration in, or to cancel or revise, any of the courses listed. The curricula may also be changed as deemed advisable by Senate. Information concerning limitations on registration and attendance for the various faculties and schools is found in the sections of this calendar devoted to those faculties and schools.

(b) Except in special circumstances, no student under the age of sixteen is admitted to the University.

REGISTRATION

Every student is required to state the names of all educational institutions of secondary or higher level attended and to submit evidence of the standing obtained at each.

1. *Registration for New Students:* As a preliminary step, a student applying for registration for the first time in the University must obtain from the Registrar's office an Application for Admission form. The completed form, together with necessary certificates and two recent passport-type photographs of the applicant, must be submitted by August 1 in the case of a student proposing to attend the winter session, and by April 1 for the summer session. (For application dates, Faculties of Medicine and Pharmacy and Schools of Architecture, Nursing and Social Work students are referred to appropriate sections of this bulletin.)

Following receipt of this form the applicant will, in due course, be advised with respect to his admission and standing, and, if eligible, given instructions on procedure for completing registration.

Documents submitted in support of applications become the property of the University and must remain in the office of the Registrar.

2. *Re-registration:* A student in the regular winter session will be sent, along with a statement of his marks, an Authorization to Register if he has qualified for admission to the next higher year of his course, or an Application for Registration, as soon as possible after the sessional examinations.

Change of Programme: A student who wishes to transfer to another faculty or school within the University should notify the Registrar of his intentions well in advance of the opening of the next session.

3. **Completion of Registration:** Registration must be completed in person on the dates indicated in the Authorization to Register form. Assessed fees are due and payable at the time of registration. No student will be permitted to complete registration until such fees have been paid.

Each student is required as part of his first application to furnish the information necessary for the University record, and to sign the following declaration:

"I hereby accept and submit myself to the statutes, rules and regulations, and ordinances of The University of British Columbia, and of the faculty or faculties in which I am registered, and to any amendments thereto which may be made while I am a student of the University, and I promise to observe the same."

In the information furnished for the University records, the student is requested but not required to indicate his religious denomination. This information is available upon request to the representatives of the denominations.

4. **Change of Registration:** A student desiring to make a change in the programme of courses for which he has registered must apply to the Registrar's office. Except in special circumstances, no change will be permitted after two full weeks of the autumn term have elapsed.

All other pertinent changes, including those in address and telephone number, must be reported promptly to the Registrar's office.

5. **Student Responsibility:** Each student is responsible for the completeness and accuracy of his registration. He must ensure that there is no discrepancy between the programme he is following and that entered on his course card in the Registrar's office.

A student may not take courses for which he has not registered, and may not drop courses without permission.

CLASSIFICATION OF STUDENTS

1. **Full:** a student proceeding to a degree in any faculty who has met all requirements of the year in which he is registered.

2. **Conditioned:** a student proceeding to a degree with defects in his standing which do not prevent his entering a higher year under the regulations governing *Examinations and Advancement* of the faculty in which he is registered.

3. **Occasional:** a student who has been granted permission to enroll in certain courses and attend classes on the understanding that he will not be entitled to credit towards a degree in any work taken.

This category includes the student who, because of maturity, has been permitted to enroll in spite of deficiencies in his formal academic record. In the event that he obtains sufficiently high standing and indicates his desire to proceed to a degree, he may later be given credit by the faculty concerned for all or part of the work taken.

4. Probationary:

(a) A student who passes in fewer than 6 units (2 courses) in the first year of University following Grade 12 will not be permitted to re-enrol at University to repeat the studies of that year. Consideration will be given to re-admitting a student in this category following his satisfactory completion of at least two semesters at a regional or junior college, or Grade 13

or its equivalent. A student who passes 6 units, while not receiving credit in the year, may re-enrol on probation to repeat his studies but during the subsequent session may be required to withdraw at any time for unsatisfactory progress.

(b) A student in the First Year who obtains credit for only 9 units on a full programme will be re-admitted on probation but during the subsequent session may be required at any time to withdraw for unsatisfactory progress.

(c) A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to withdraw from the University; he may be re-admitted after a period of at least one year if his appeal to Senate is supported by the Committee on Admissions of the Faculty concerned and upheld by Senate.

GENERAL CONDUCT

The University authorities do not assume responsibilities which naturally rest with parents. This being so, it is the policy of the University to rely on the good sense and on the home training of students for the preservation of good moral standards and for appropriate modes of behaviour and dress.

ATTENDANCE

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

FEES

1. The University reserves the right to change fees without notice. Students who have not completed their course requirements when a change in fees is made will be affected by the change.

2. Fees must be paid by certified cheques, bank or postal money orders or by travelers cheques (payable to "The University of British Columbia").

3. The schedules below for full-time students give fees payable by students in each winter session, including the "Alma Mater" fee but not the "Graduating Class" or "Hospital" fee.

4. The Alma Mater fee, authorized by the Board of Governors, is exacted from all students in the winter session for the support of the Alma Mater Society. This fee is \$29 for students taking more than 6 units of work, and \$19 for others. Inquiries with respect to this fee should be directed to the Alma Mater Society (Brock Memorial Building).

5. The Graduating Class fee, authorized by the Board of Governors, is exacted from all students in the winter session who are registered in the Final Year of a course leading to a first bachelor's or the M.D. degree. This fee of \$7 is for the support of the graduating class activities. Inquiries with respect to this fee should be directed to the Alma Mater Society (Brock Memorial Building).

6. In the winter session, no refund will be made for first term fees after October 28, and for the second term fees after February 15. In the computation of refunds prior to these dates an amount of \$36 (\$35 tuition fee; \$1

Alma Mater fee) will be charged for each week, or part of a week, prior to the date on which the student notifies the Registrar officially of his cancellation of registration or his withdrawal from the University.

7. The first term fees must be fully paid before registration is accepted. Students are not entitled to admission to classes until they have registered. The second term fees become due on the first day of lectures of the second term; students should mail certified cheques, bank or postal money orders for second term fees to the Accounting Office before this date with a note showing name and registration number.

8. Fees are not transferable from one session to another.

9. Cheques for the first half of a scholarship or bursary will be available at the time of registration. Cheques for the second installment will be available at the cashier's wicket on January 3. Provincial government award cheques must be collected at the Accountant's Office and cashed or endorsed and applied on fees before September 30, in the first term and before January 16, in the second term. The Accountant is required to return to Victoria any cheques which have not been picked up or endorsed by the above mentioned dates. If cheques covering Scholarship or Bursary awards are not collected and applied on fees on or before January 16, 1967, the regulations covering late payment fee assessments (see section 11 below) will apply.

10. When permission to register late is granted, a late fee additional to all other fees, will be charged. The late fee is \$25 on September 19, and \$25 plus \$5 per diem on and after September 20. This fee must be paid at the time of registration together with the first term fees. Refund of this fee will be considered only on the basis of a medical certificate covering illness or on evidence of domestic affliction.

Students undertaking summer employment should understand that the late registration fee will not be waived if, because of the employment, they are not able to be present to register during registration week. Such students should honour their contracts and budget for the late fee as part of their summer financing.

11. In the Second Term a late payment fee of \$20 additional to all other fees will be assessed after January 16, 1967; this fee will be increased to \$30 after January 31, 1967. If fees are not paid in full by February 15, 1967, the registration of students concerned will be cancelled and they will be excluded from classes.

If a student whose registration has been cancelled for non-payment of fees applies for reinstatement and his application is approved by the Registrar, he will be required to pay a reinstatement fee of \$10, the late fee of \$30, and all other outstanding fees before he is permitted to resume classes.

12. Students living outside the Province of British Columbia are not eligible for payment of hospitalization under the British Columbia Hospital Insurance Service until they have lived in the Province for 3 months, at which time they are automatically covered.

The University of British Columbia, on payment of a fee of \$5 at the time of registration, will provide hospitalization for out-of-Province students in the University Health Service Hospital during this 3 months waiting period. If this \$5 is NOT paid, the expense of hospitalization will be the student's responsibility. All Canadian provinces accept full responsibility for hospital costs for their students attending the University of British Columbia provided the hospital insurance premiums (required in Ontario, Manitoba and Saskatchewan) have been paid. If the student has any hospital insurance, such as Blue Cross, an exemption can also be made but it is the student's

responsibility to see the account is collected and paid. The 1965 rate in the University Health Service Hospital was \$19.05 per day.

N.B. Attention is drawn to page A34, Extended Health Coverage (M.S.I.), which does not cover hospital expenses.

Students not living in British Columbia should read the above carefully.

Full-time Students

First Term Fees—Payable in full at the time of registration. However, students may pay both first and second term fees at time of registration.

Second Term Fees—Payable in full on or before the first day of lectures in the second term. Students should mail certified cheques, bank or postal money orders for second term fees to the Accounting Office before this date with a note showing name and registration number.

Faculty and Course:	1st Term	2nd Term	Total
1. Agriculture—	(includes A.M.S. fee)		
Agriculture (B.S.A.)	\$249.00	\$220.00	\$469.00
Occupational	194.00	165.00	359.00
Students transferring credit from the Occupational Course must pay the difference in fees at the time of transfer.			
2. Applied Science—			
Architecture (B.Arch.)	290.00	261.00	551.00
Engineering (B.A.Sc.)	290.00	261.00	551.00
Nursing (B.S.N. or Diploma)	219.00	190.00	409.00
3. Arts—			
Arts (B.A.)	243.00	214.00	457.00
Home Economics (B.H.E.)	243.00	214.00	457.00
Librarianship (B.L.S.)	266.00	237.00	503.00
Music (B.Mus.)	301.00	272.00	573.00
Social Work (M.S.W.), 1st Year	266.00	237.00	503.00
2nd Year	243.00	214.00	457.00
4. Commerce and Business Administration—			
First Year (B.Com.)	243.00	214.00	457.00
Other Years	282.00	253.00	535.00
(B.Com-C.A.) Spring Term			119.00
5. Dentistry	351.00	322.00	673.00
6. Education—			
Education (B.Ed.)	243.00	214.00	457.00
Industrial Arts Emergency			
Day Programme	39.00		39.00
Physical Education (B.P.E.)	243.00	214.00	457.00
7. Forestry (B.S.F.)	282.00	253.00	535.00
8. Law (LL.B.)	282.00	253.00	535.00
9. Medicine—			
Medicine (M.D.)	351.00	322.00	673.00
Rehabilitation Medicine	219.00	190.00	409.00

	1st Term	2nd Term	Total
10. Pharmacy (B.S.P.)—			
First Year	243.00	214.00	457.00
Other Years	282.00	253.00	535.00
11. Science	243.00	214.00	457.00

12. Graduate Studies:

The Graduate Student Centre fee of \$12.00, authorized by the Board of Governors for the support of the Graduate Student Centre, is required of all "on campus" students registered in the Faculty and is payable in full at the time of registration. Graduate students in Summer Session are assessed a fee of \$3.00. The Alma Mater Society fee of \$29.00, authorized by the Board of Governors, is required of all students in their first year in the Faculty.

(a) Ph.D. or Ed.D. degree:	1st Term	2nd Term	Total
First Year	\$191.00	\$150.00	\$341.00
Second Year	162.00	150.00	312.00
Third Year	162.00	150.00	312.00
each subsequent year on campus	62.00	.....	62.00
each subsequent year off campus	25.00	.....	25.00

A student taking a master's degree at the University of British Columbia and then proceeding to a doctor's degree shall pay fees as listed for the Ph.D. degree beginning at the Third Year. A student with the master's degree from elsewhere will be exempt the fees as scheduled for the Third Year.

A student who fails to register as required will forfeit his candidacy; it will be re-established only if his application for reinstatement is approved by the Head of the Department concerned and the Dean of Graduate Studies, and the student pays a fee of \$100.00 plus any applicable incidental fees.

(b) Master's degree:

18-21 unit programme. Total fee \$600.00 plus Graduate Study Centre fee and A.M.S. fee when applicable.

	1st Term	2nd Term	Total
1st Year	\$191.00	\$150.00	\$341.00
2nd Year	162.00	150.00	312.00

Candidates completing the degree requirements before the end of the 2nd Year will be required to pay the balance of fees before the degree is conferred.

	1st Term	2nd Term	Total
each subsequent year on campus	\$ 62.00	.....	\$ 62.00
each subsequent year off campus	25.00	.....	25.00

A student who fails to register as required will forfeit his candidacy; it may be re-established only if his application for reinstatement is approved by the Head of the Department concerned and the Dean of Graduate Studies, and the student pays the total of the prescribed fees for the years in which he failed to re-register. Any student who completed residence requirements prior to September 1965 will be required only to re-register and pay fees for the session in which work for the degree is to be completed.

30-36 unit programme (Planning; Business Administration)

	1st Term	2nd Term	Total
1st Year	\$261.00	\$220.00	\$481.00
2nd Year	232.00	220.00	452.00

- (c) Master's candidates taking their course work during Summer Sessions or those who do not pay the fees as indicated in (b) will be assessed fees on a course basis. The Summer Session Association or A.M.S. fee will be assessed on registration in each session. Master's candidates taking their course work during Winter Sessions may attend Summer Session courses, if recommended by their study programme advisors, without further payment of fees.
- (d) Graduate students accepted as candidates for a graduate degree who are required to take prerequisite courses may do so up to a total of 9 units of course work without additional fee; they are subject to sessional fees of \$30.00 per unit for courses beyond 9 units, in addition to the regular course fees of a graduate programme. Graduate students not so accepted will be assessed fees on a per unit basis for all courses taken. Fees paid under these circumstances will not subsequently be credited in a graduate degree programme.
- (e) Graduate students not working toward a graduate degree will be registered as Unclassified and will be assessed fees on the same basis as for "Part-time Students" (see next section).

†Part-time Students

- For a course of 12 units or more:
The same as for full-time students.
- For a course of above 6 but below 12 units: \$30 per unit.
First Term—Fully payable at the time of registration:
Alma Mater fee \$29.00
One-half of course fees.
Second Term—Fully payable on or before the first day of lectures of the second term:
Balance of course fees.
- For a course of not more than 6 units: \$30 per unit.
First Term—Fully payable at the time of registration:
Alma Mater fee \$19.00
One-half of course fees.
Second Term—Fully payable on or before the first day of lectures of the second term:
Balance of course fees.

Extra-Sessional Courses

Fully payable at the time of registration:
Sessional fee per 3-unit course \$100.00

†Students in faculties whose courses are not on a unit basis should consult the Registrar.

Summer Session**Fees payable on Registration:**

Minimum Class Fee	\$ 50.00
3-unit course	100.00
2-unit course	68.00
1½-unit course	50.00
1-unit course	34.00
½-unit course	17.00
Summer Session Association	2.00
Change of course	5.00
Graduate Student Centre	3.00
Auditor only—one-half regular tuition fee.	

Correspondence Courses

The correspondence course fee for a three-unit course is \$100.00.

Refunds will be granted if applied for in writing within ninety days of registration on the following basis:

- (1) within 30 days, refund \$85.00
- (2) within 60 days, \$60.00
- (3) within 90 days, \$35.00

Correspondence students may take examinations at the University free of charge; an invigilation fee of \$10.00 is payable for examinations held at other centres. Supplemental examination fees are the same as those given under "Special Fees" below.

Special Fees

For late registration, winter session (on September 19, 1966)	\$25.00
(\$25.00 plus \$5.00 per diem on and after September 20.)	
For late payment, Second Term fees — after January 16	20.00
For late payment, Second Term fees — after January 31	30.00
For late registration, summer session	20.00
For reinstatement after cancellation of registration	10.00
Change of course, Summer Session	5.00
Regular supplemental examination, per paper	7.50
Supplemental examination at regular centres, per paper	10.00
Supplemental examination at special centres, per paper	20.00
Special examination (Applied Science, Agriculture, Forestry), per paper	20.00
Re-readings, per paper	5.00
Library (extra-mural readers)	7.00
Library (mailing deposit)	2.00

Students borrowing books from the Library for preparatory reading will be required to make this deposit to cover mailing costs.

Laboratory coupons, per book	3.00
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These coupons may be used to pay for breakages in laboratory equipment, or for such other purposes as may be determined by the Board of Governors.

Fees for transcripts of academic record: first one free-of-charge, except following graduation, when the first three are free-of-charge; additional transcripts, \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment received.

THE UNIVERSITY HEALTH SERVICE

The University Health Service is located in the West Wing of the Westbrook Building and comprises an up-to-date Out-Patient Department on the main floor together with a twenty-six bed hospital on the third floor. The Health Service is not a teaching department; it is maintained solely for the benefit of students who may require medical care and advice, especially those whose homes are not in Vancouver or vicinity, or who have no regular family doctor.

In addition to providing medical and nursing care and investigation of any health problems arising in students, the Health Service also provides chest X-rays and various immunization procedures.

Full details of the scope of service provided and how the student may best avail himself of the facilities offered, are set forth in the brochure, "Student Health Service", issued to all new students. Others may obtain copies of this brochure at the Health Service office.

Requirements of the University Health Service Medical Examinations

1. Students registering at this University for the first time are required to have a medical examination before registration can be completed. This examination is not provided by the University and is the applicant's personal responsibility. The necessary forms are provided at the time of acceptance. Evidence of successful immunization against smallpox is required. A skin test for tuberculosis is also required. This is done in the Health Service during September. Registration for those students who do not comply with this examination may be cancelled.

2. Students registering in professional Physical Education courses are required to have a physical examination by health service physicians. Appointments for these examinations must be made at the time of registration. The examination must be completed during the first two weeks of the session.

3. A successful applicant who is taking his premedical or pre dental work at the University of British Columbia is required to have a physical examination at the University Health Service preceding admission to the Faculties of Medicine or Dentistry. A successful applicant to the Faculty of Medicine from another institution must submit, prior to registration, a medical certificate from his own physician, on the form provided by the University Health Service. Immunization against smallpox is required.

Applicants having physical handicaps which require periodic medical attention, or which interfere with normal activities, must submit a medical certificate with their application. In this certificate, the examining physician should describe the extent of the deformity or lesion and estimate its effect upon the applicant's future ability to practise medicine or dentistry.

4. Students who are members of inter-collegiate athletic teams must have a yearly medical examination preceding active participation. The team manager will make the appointment and will check each student's physical capacity card before the first game.

5. Students who have been away from the University for a year or more are required to report to the Health Service. A repeat medical examination will not necessarily be required.

Communicable Disease Programme

Preventive tests and inoculations are given by the Health Service. Tuberculosis.

A tuberculin test is provided by the University Health Service in cooperation with the Provincial Board of Health, Tuberculosis Division. Free chest x-rays are also available.

Routine Regarding Absence due to Sickness and Injury

1. Students absent from December or April examinations must submit a certificate obtained from a doctor during their illness. This certificate must be in the Health Service office within the current examination period.

2. Students absent at other times during the session should report to their instructors. If the instructor wishes, he may refer the student to the Health Service.

Medical Services Incorporated (M.S.I.) — An insurance Plan to provide certain medical care not supplied by the Health Service —

1. Single Plan. Special arrangements have been made between the University and Medical Services Incorporated (a non-profit pre-paid medical plan sponsored by the doctors of British Columbia) whereby students may obtain insurance to pay for

- (i) all physicians' and surgeons' services in hospital not provided by the Student Health Service,
- (ii) immediate home and office care for accidents and injuries only and
- (iii) a specialist consultation when referred by a Health Service physician.

This insurance may be purchased by all students at the time of registration, or until October 1 of the new term. The rate varies year by year according to utilization. This year's rate was \$10.00 per year for single students. The low rate is possible because most illnesses that occur in the University student can be looked after by the Student Health Service, for which there is no charge. Medical care for spouses and families is not provided by the Health Service.

2. Family Plan. The University and Medical Services Incorporated contract for married students and their children provides limited coverage at the rate of \$30.00 per year. This includes

- (i) immediate maternity benefits.
 - (ii) all physician and surgeon care while in hospital, and
 - (iii) home and office visits for immediate care for accidents and injuries.
- It does not provide for office or home visits for illness.

This insurance is only to cover the physician's services, as stated above, and has nothing to do with costs of hospital care.

Full details of these services may be obtained from the Health Service Office or at registration. All students are urged to obtain the insurance.

3. Many university students are eligible for subsidy under the B.C. Medical Plan, sponsored by the Provincial Government. This Plan provides comprehensive medical care. For further details consult the Health Service or the B.C. Medical Plan, 1410 Government Street, Victoria, B.C.

Hospitalization in University Health Service Hospital for Out-of-Province students

Students living outside the Province of British Columbia are not eligible for payment of hospitalization under the British Columbia Hospital Insurance Service until they have lived in the Province for 3 months, at which time they are automatically covered.

The University of British Columbia, on payment of a fee of \$5 at the time of registration, will provide hospitalization for Out-of-Province students in the University Health Service Hospital during this 3 months waiting period. If this \$5 is NOT paid, the expense of hospitalization will be the student's responsibility. All Canadian provinces accept full responsibility for hospital costs for their students attending the University of British Columbia provided the hospital insurance premiums (required in Ontario, Manitoba and Saskatchewan) have been paid. If the student has any hospital insurance, such as Blue Cross, an exemption can also be made but it is the student's responsibility to see the account is collected and paid. The 1965 rate in the University Health Service Hospital was \$19.05 per day.

Summer Session

The University Health Service provides a health service for students attending the summer sessions. Details of this service may be found in the *Announcement of the Summer Session*.

STUDENT HOUSING

Principles of University Housing

Since residence living within the university is both an educational opportunity and a privilege and is integrated with the academic programme, the university reserves the right to determine who can benefit from this experience, and who can in turn contribute to the academic community.

Residence living is concerned not only with the physical environment into which students are placed, but also with activities which provide an educational experience which should develop the social, emotional and intellectual stability of each individual student, and which should encourage his sense of responsibility.

The university endeavours to provide an atmosphere conducive to intellectual and social development, and to help students maintain a set of good moral standards. However, it does not assume responsibilities which naturally rest with parents.

The university expects a student in residence to have a commitment towards his own intellectual development; to mature in the responsibility of self-government and to display courtesy, respect and consideration for the feelings and rights of others.

Eligibility

First consideration for university housing is given to students who carry a full programme of at least 15 units.

Depending on the volume of new applications, it may be necessary to give a lower priority to students who already have had the privilege of living in university residences for more than three years.

Graduate students must be accepted by the Faculty of Graduate Studies.

Students living in the greater Vancouver area are not normally considered for accommodation because of shortage of space. Exceptions may be made in special circumstances.

All assignments for residences are subject to the Registrar's acceptance of the applicant to the university.

General Information

All enquiries for accommodation should be directed to the Office of Housing Administration, University of British Columbia, Vancouver 8, B.C.

The university provides accommodation for single students on a room and board basis only. Married quarters are rented on a room only basis.

The university has accommodation for 750 men students in temporary dormitories in Acadia and Fort, 395 in permanent residences situated in Lower Mall and 400 at Totem Park. Some 160 women students can be accommodated in temporary dormitories in Acadia, 980 women in permanent residences in Fort Camp, Lower Mall and Totem Park. Each of these areas has its own dining and recreational facilities. A special area for graduates who wish to live in dormitories has been established at Acadia Camp.

No one needing special diet can be accommodated in university housing.

No facilities are available in residence for students under special medical care.

Married students may be accommodated in a limited number of unfurnished suites in the Acadia Camp area.

Application for Accommodation

Application forms for both male and female accommodation can be obtained from: Office of Housing Administration, University of British Columbia, Vancouver 8, B.C.

All applications must be accompanied by a caution and damage deposit of \$25.00 payable to the Accounting Office. A student who does not receive a room assignment will have this deposit refunded in full.

Although applications may be submitted at anytime, consideration is given to applications each year as from February 1 for the next fall term. Applications are considered effective from date of receipt of the caution and damage deposit.

The amount of accommodation available does not meet the demand and students applying late will be disappointed.

Assignment notices are mailed on or before July 1 for fall term and for the spring term as soon as vacancies are known to Housing.

Students already in residence will receive new application forms for the following year as from February 1. These are to be returned to Housing by March 1.

Priorities in Assignment

Men Students

Preference is given to students already in residence but who have lived less than 3 years in university accommodation and to first and second year students taking a full university programme of at least 15 units.

Consideration is also given to senior undergraduates and graduate students who will be interspersed within all residences to offer guidance and leadership to younger students.

Women Students

Preference is given to first and second year students 19 years of age and under and to those who are new to the university.

Acadia Camp is reserved for men and women students over 21 years of age.

Date of Occupancy

Fall Term — 1966. Students attending early starting faculties may be housed anytime after September 1. The regular term fee covers the period from September 19 to December 20, 1966. Earlier arrival will be charged at a daily rate for room and board.

Spring Term — 1967. The Spring term commences January 4 and finishes May 4, 1967.

Meals will be available with breakfast on the first day until supper on the day of departure.

Meal passes are issued at the residence office for all sessions.

Between-Term Accommodation

Students wishing to stay through for Christmas or who attend faculties finishing later than the above-mentioned date may stay in residence on a daily rate which covers room and board.

The university has a limited number of rooms available for those students who, for academic reasons, need to stay in residence during the *summer period*. If space is available, then consideration may be given to students who wish to remain in residence for other than academic reasons.

Withdrawal of Application for Housing

Fall Term

A student may withdraw his or her assignment without penalty anytime up to August 1 providing the assignment notice is issued by July 1.

Students assigned later than July 1 may cancel without penalty within two weeks after the date of assignment.

Neglecting to inform Housing within the stipulated period will result in confiscation of the caution deposit in full.

Spring Term

Assignments for spring session may be cancelled without penalty within two weeks after the date of assignment.

Students who do not receive assignment for the fall term may leave their application and deposit with Housing Administration and will be placed on a waiting list. They will be advised as soon as vacancies occur but are encouraged to keep their mailing address up to date. On February 1 each year, all old waiting lists will be destroyed and deposits refunded to those who do not re-apply.

Students remaining in residence for the full session will have, upon withdrawal, their \$25.00 caution and damage deposit refunded, less any assessment deducted for damage to buildings or equipment which is over and above normal wear and tear. If a student re-applies for housing during the following session, then he or she must bring their deposit up to the full \$25.00 by August 1.

Withdrawal of Students Already in Residence

It is intended that a student assigned to university housing agrees to accept such accommodation for the full term.

A student getting married, withdrawing from university, or having any similar legitimate reason, may submit a request in writing to Office of Housing Administration asking for permission to withdraw from residence.

All students under the age of 21 years must obtain parental consent prior to seeking permission to leave residences during term.

Two weeks notice in writing must be made. Full room and board for this period will be charged even if the student is vacating immediately. A student withdrawing from residence at any time during term will forfeit the caution and damage deposit in full.

A student leaving at the end of the fall term, who has given two weeks notice in writing to Housing of his or her intention not to return for the spring term, will forfeit \$10.00 (plus any assessment) from the caution deposit. The balance will be refunded.

A student will not be considered to have left residence until officially signed out by the Residence Clerk and until room key and meal pass are surrendered. Full room and board will be charged until all the requirements for signing out are met. If no notice in writing is given, then two weeks room and board will be charged from the date of completing the signing out requirements.

Inter Residence Transfer

Students wishing to transfer within the different residential areas must obtain the recommendation of their Residence Don. No transfer request will be approved before October 1 each year. No transfers are available during the summer session.

Residences and dormitories usually are filled to capacity and vacancies are scarce. Transfer therefore is difficult.

Off Campus Accommodation

The Alma Mater Society offers a student housing list as a service to its members.

In compiling this list every effort is made to compile descriptions of available homes in a strictly objective manner. Students must make their own arrangements for the contractual relationship between tenant and landlord. Listings are available from the Co-Ordinator, Off-Campus Housing, A.M.S., Brock Hall, U.B.C., Vancouver 8, B.C.

Special Accommodation

The Dean of Women provides a limited service to women students who wish to work for their room and board. A file for such recommended accommodation may be consulted by students in the Office of the Dean of Women.

Foreign students may receive additional help in finding off-campus housing through the services of International House. A very limited number of meal passes for off-campus students are available from the Office of the Director of Food Services.

Residence Fellowships

Residence Fellowships are awarded annually to persons appointed to positions at all men's and women's residences, (permanent and temporary). These appointments are made upon recommendation of the Dean of Student Affairs and the Dean of Women. The types of fellowships are:

- (a) Dons — with counselling and administrative responsibilities.
- (b) Resident Fellows — with responsibilities for assisting dons.

Requests for further information and application forms should be made to the Office of Housing Administration. Applications must be submitted before May 31. Appointments are confirmed by July 1.

Standards in Residence

Since residence living is an integral part of the student's academic experience, each student is expected to have a commitment towards his own intellectual development as an individual and as a member of society.

University residences are for students — past, present and future and each student therefore should accept responsibility for the care and proper use of all university property and should also respect the personal property of other students.

A student in residence should display courtesy, consideration and respect for the feelings of others and he is expected to maintain a standard of behaviour which reflects his membership in the academic community.

As an integral part of the university community, residences provide not only room and board but also a centre for study, reflection, relaxation, and rest. Students are expected to co-operate to attain these goals and in particular to respect the privacy of each resident.

University policy prohibits the keeping or consumption of alcoholic beverages in residences.

Men are not permitted to enter dormitories occupied by women students except on special occasions when previous arrangements have been made. Reciprocal rules apply to women.

No individual or group of residents possess the right to endanger the life of others:

- (a) Tampering, interfering or mishandling fire equipment will not be tolerated.
- (b) No fire-arms, airguns, or ammunition may be kept in residences.

Students who manifestly neglect their studies or whose conduct does not reflect their willingness to maintain these standards, will not be permitted to continue to occupy university accommodation.

Rates for Board and Lodging 1966-67

Only Board and Room arrangements are available.

FALL TERM — Rate for Term

	Single Room	Double Room
Permanent Residences	\$276.00	\$261.00
Dormitories	\$223.00	\$207.00
Graduate Dorms	\$246.00	
Mary Bollert Annex	\$246.00	\$230.00

SPRING TERM — Rate for Term

Permanent Residences	\$360.00	\$340.00
Dormitories	\$291.00	\$270.00
Graduate Dorms	\$321.00	
Mary Bollert Annex	\$321.00	\$300.00

BETWEEN TERM ACCOMMODATION — Daily Rates for Students

Permanent Residences	\$3.00	\$2.85
Dormitories	\$2.45	\$2.25
Graduate Dorms	\$2.70	
Mary Bollert Annex	\$2.70	\$2.50

Note: Permanent residences include Lower Mall, men and women, Totem Park, men and women, and Fort Camp, women. Dormitories include Acadia Camp, men and women, and Fort Camp, men. Graduate Dorms for men and women are located in Acadia Camp. Mary Bollert Annex is an intermediate dorm located in Fort Camp.

DEAN OF WOMEN'S OFFICE

The Dean of Women's Office (Buchanan Building Room 456) acts in a consultant and liaison capacity in matters pertaining to the welfare of women students at the University. Parents and students should feel free to consult the Dean of Women about academic courses leading to the various professions open to women, opportunity for employment in different fields, living conditions and other matters relating to the happiness and success of the women students. Students are referred to the appropriate faculty or department within the University for detailed information about specific courses and regulations concerning admission.

Although all University Housing is administered through the office of the Housing Administration, the Dean of Women and her staff assists actively in the recruitment and training of staff for the women's residences. The Office of the Dean of Women is also available as a consultant in the development of a programme to groups in residence halls as well as on campus. In addition, a limited service is provided to women students who wish to work for their room and board. A file of such recommended accommodation may be consulted by students in the Office of the Dean of Women.

OFFICE OF STUDENT SERVICES

The office of student services, situated on the West Mall, has three main functions: (a) counselling, (b) placement and (c) testing.

Enquiries should be addressed to the Director of Student Services, University of British Columbia, Vancouver 8, B.C.

(a) *Counselling:* Full-time counsellors are available to confer with students regarding academic, vocational and personal matters. However, in academic matters students should also consult advisors in the faculty in which they are registered or plan to register with reference to course requirements, prerequisites and study programmes. The office is open during the summer months and it is particularly desirable that students planning to enter the University secure an interview during June, July and August. In assisting students the office maintains an up-to-date library of calendars or bulletins of most of the major Canadian and American universities, together with a file on professional and vocational opportunities. Copies of the booklets *Career Planning for Students at the University* and *Student Information Bulletin* are available on request.

(b) *Testing:* The office administers a battery of tests to all new undergraduates entering the University from both Grade 12 and Grade 13. All

students entering the University at the first or second year level are required to write these tests. Testing sessions, lasting approximately three and a half hours, are scheduled on the dates indicated below.

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The following dates are primarily for students living on the lower mainland.

Saturday, May 28	University Armoury	9:00 a.m.
Friday, June 3	University Armoury	1:00 p.m.
Saturday, June 4	University Armoury	1:00 p.m.

The following dates are primarily for foreign students and for students from the interior of British Columbia, but are also for others who may not have been able to attend previous testing sessions.

Saturday, July 23	University Armoury	9:00 a.m.
Saturday, August 13	University Armoury	9:00 a.m.
Saturday, September 10	University Armoury	9:00 a.m.
Monday, September 12	University Auditorium	2:00 p.m.
Monday, September 12	University Auditorium	7:00 p.m.
Tuesday, September 13 to Friday, September 16 inclusive	University Auditorium	1.00 p.m.

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May 27, June 2, 3.

Interviews will take place during the summer months and following.

Testing and consultation for students in senior years is by appointment at any time throughout the year. Testing of special groups will be announced during the term.

The College Entrance Examination Boards, The Medical College Admission Test, The American College Testing Programme, the Graduate Record Examination and the Test for Graduate Study in Business are also administered. Students wishing to write these tests can obtain further information at the Counselling Office.

(c) *Placement*: The placement section endeavours, in cooperation with the various faculties concerned, to assist in securing part-time, vacation, and permanent employment for undergraduates and graduates. Graduating students who are seeking employment should obtain the bulletins which are published periodically listing companies visiting the campus for recruitment purposes. Close liaison with the National Employment Office is maintained. Registration for part-time employment should be made early in September. Registration for employment after graduation is made in October and for summer employment in March.

Self-help Programme: Employment opportunities on the campus are available for a limited number of students. In order that there may be as little interference with studies as possible and in order to take care of the maximum number of applicants, jobs will normally be limited to ten hours per week. Applicants for bursaries may be offered employment either in place of a bursary or as a supplement to a bursary. Applications for employment should be submitted early in September.

(d) *Veterans' Affairs and Educational Assistance Act*: All the facilities of the student services office are available to ex-service students. All ex-service students on allowance and all students under the Educational Assistance Act must be interviewed by a counsellor on or before registration.

THE UNIVERSITY BOOK STORE

The book store is prepared to supply all textbooks, note-books, instruments and general stationery required by students. Hours are 8:45 to 5 p.m. Monday through Friday.

During the month of September, supplies and books will be available as follows:

1. New and used books of all faculties *except* Architecture, Dentistry, Law, Librarianship, Medicine, Pharmacy and Social Work, will be sold in the Field House;
2. New and used books for the above exceptions will be sold in the Book Store.
3. General supplies and stationery for all years of all faculties will be sold in the Book Store.

At the end of each regular and summer session, the book store will repurchase from students used books in good condition up to the estimated requirements for the next regular session. These books will be accepted from students until June 15 for the regular session and to August 25 for the summer session.

TRAFFIC AND PARKING

General. Systematic regulation of traffic speed and direction, and of parking and stopping, will be enforced on the campus. Brochures outlining traffic and parking regulations will be available at the Traffic Office, 1801 Wesbrook Crescent. These regulations remain in effect throughout the year, and all faculty, staff and students of the University, and visitors, are responsible for familiarizing themselves with them. No parking is allowed on roadways or in any area not designated for parking.

Registration. Members of the University wishing to park motor vehicles on campus during the daytime, summer and fall, are required to register them and to obtain appropriate parking permits, for which a fee will be charged. Permits are obtainable at the Traffic Office.

Day Parking. Parking areas will be provided for faculty, staff and students who have valid parking permits. Areas will be clearly marked and must be used in accordance with the parking permit. Pay parking lots are available for visitors.

Night parking regulations come into force at 5:00 p.m. Monday through Friday and at 12:30 p.m. Saturday. Day parking lots are available for visitors, but drivers may also park free at night in any other designated parking lot except in:

- (a) Lots, meters and individual parking spaces which are signed restricting parking by night as well as by day.
- (b) The Faculty Club and Graduate Centre lots reserved for members and their guests.
- (c) Lots which are not the property of the University, such as the Theological College parking lots.

STUDENT ORGANIZATION

Alma Mater Society

The Alma Mater Society with its governing executive, the Students' Council, controls all student activities and is responsible for student discipline. Every student automatically becomes a member of the Alma Mater Society

when he enrolls in the University and each faculty has a representative on Council. Members of Students' Council are elected every spring to hold office through the next year.

The Society levies a compulsory fee of \$14 upon each student, which may be augmented for special purposes by action of its membership. At present, an additional levy of \$15 to be used for student union facilities, brings the Alma Mater fee to a total of \$29.

The offices of the Alma Mater Society are in the south end of the Brock Memorial Building.

Publications

The Alma Mater Society publishes "The Ulysses", student newspaper which appears three times weekly; the "Totem", which is a two-volume activity and graduate book; "Tuum Est . . . and all that", an introductory handbook about student affairs; and "Bird Calls", a student telephone directory. In addition several undergraduate societies publish technical journals of interest to their respective professions.

University Clubs Committee

The University Clubs Committee (U.C.C.) is comprised of representatives from each of the campus clubs (numbering nearly 100). The U.C.C. executive administers to these clubs' needs and directs their activities.

A list of these clubs will be found in "Tuum Est", and they may be contacted through the A.M.S. in Brock Hall.

Women's Athletics

All women students in the Alma Mater Society are members of the Women's Athletic Association and are eligible to participate in the intramural and extramural women's athletic programme. There are eighteen extramural sports and eleven intra-mural sports. This programme is run entirely by the students.

Further information appears in "Tuum Est".

Men's Athletics

All male students are members of the Men's Athletic Association and, as such, have the opportunity to participate in the broad, twenty-seven sport, extramural programme. Athletics are administered by the Men's Athletic Committee formed of Faculty, students and alumni representatives. The Athletic Director is responsible to the Men's Athletic Committee for the implementation and direction of the sports programme.

Further information appears in "Tuum Est".

Fraternities and Sororities

Fraternities and sororities are recognized by the Senate of the University as student organizations. Fraternities are governed by the Inter-Fraternity Council composed of representatives of each of the fraternities and a member of the faculty. Membership in fraternities is by invitation. Sororities are governed by the Women's Panhellenic Association. Membership in sororities is by invitation.

The Brock Memorial Building

In connection with the celebration of the twenty-first anniversary of the opening of the University in 1936, it was decided that a memorial be established by general appeal to students, graduates, and friends of the University

throughout Canada. A committee representing all branches of the University decided that the memorial should take the form of a student union building, dedicated to the memory of the late Dean of Applied Science, Reginald W. Brock, and Mrs. Brock, by whose tragic deaths as a result of an aeroplane accident the University suffered a great loss.

The original fund for the construction of the building was subscribed by relatives of Dean and Mrs. Brock, friends of the University throughout Canada and the United States, alumni and students of the University, and former colleagues of Dean Brock. The balance of the amount required to complete construction was provided by the students and the Board of Governors in cash and through a bond issue of the Alma Mater Society.

Furnishings for the building were provided from a fund raised over a period of years by the Women's Union Building Committee of the University. The Brock Memorial Building was dedicated in January, 1940.

The building is situated adjacent to the playing fields and the Women's Gymnasium. Located in the main building are the offices of the Alma Mater Society, individual offices of the Students' Council Executive, the University Radio and Television Society, and Publications offices, including "The Ubyssy", the student newspaper. The building also contains a women's common room, a television and recreation room, coffee shop, conference rooms, and, of course, the main Brock Lounge.

In the fall of 1957, a north wing was completed. The modern extension, entirely financed by student funds, contains a recreational area with billiard tables, dance floor, barber shop, art gallery, and lounge. It also houses the Alumni Association, College Shop, and various club offices and meeting rooms.

Student Union Building

The Alma Mater Society is currently planning a new union building for the corner of East Mall and University Boulevard. It will cost almost \$4 million and will replace the badly overcrowded Brock Memorial Building. The Union will house a ballroom, food services, theatre, lounge facilities, and club rooms, as well as the administrative offices of the Society.

ALUMNI ASSOCIATION OF THE UNIVERSITY
OF BRITISH COLUMBIA

HONORARY PRESIDENT—Dr. J. B. Macdonald, President of the University

Board of Management:

1965-66

Executive Committee

President: Mr. Roderick W. Macdonald
Past President: Mr. David M. Brousson
First Vice-President: Mr. John L. Gray
Second Vice-President: Mrs. K. M. Walley
Third Vice-President: Mr. Kenneth R. Martin
Treasurer: Mr. Donald McL. Anderson
Mr. Peter J. de Vooght
Mr. George S. Cumming
Mr. Vern J. Housez
Mr. Ronald S. Nairne
Mr. Kenneth Martin
Mrs. John M. Lecky
Mr. Stan Evans
Mr. W. Richard Penn

Degree Representatives

Agriculture: Dr. Richard Stace-Smith
Applied Science: Mr. David M. Carter
Architecture: Mr. Ray Toby
Arts: Mrs. B. M. Hoffmeister
Commerce: Mr. Robert S. Sinclair
Education: Dr. Leonard P. Sampson
Forestry: Mr. V. Neil Desaulniers
Home Economics: Mrs. G. M. Morrison

Law: Mr. Gordon Armstrong
Librarianship: Miss Marilyn E. Berry
Medicine: Dr. Albert Cox
Nursing: Miss Joan Funk
Pharmacy: Mr. Gordon Hewitt
Physical Education: Mr. Gordon A. Olafson
Science: Miss Joan Arnold
Social Work: Mrs. Douglas Fowler

Senate Representatives: The Hon. Mr. Justice
Nathan T. Nemetz, Mr. Franklin Walden,
Mr. Donovan F. Miller

Regional Representatives: Mr. Norman
Severide, Mrs. G. C. Kellett, Mrs. H. J.
Mackay, Mr. John R. Caldwell

Ex-Officio Members: Mr. Tim Hollick-Kenyon,
Alumni Director; Mr. Byron H. Hender,
AMS President; Mr. Bob Cruise, Students'
Council Representative; Miss Sheri Rusler,
1965 Graduating Class Secretary

The Alumni Association provides a continuing link between the graduate and the University, and seeks to maintain alumni interest in the University, to develop favorable public opinion for the University's work, and to bring the needs of higher education to the attention of the people of British Columbia.

Membership is open to all graduates and former students of the University, old McGill College and Victoria College, who have completed fifteen units of course work while in attendance. Membership status is automatic upon graduation, and a graduate becomes an active member by making a modest donation to the University throughout the Alumni Annual Giving Campaign.

The Association is governed by a Board of Management, which maintains an office in Brock Hall to carry out Association programme.

The "U.B.C. Alumni Chronicle", the Association's magazine is published quarterly by the Association and mailed regularly to contributors to the University and the Alumni Annual Giving Fund. "U.B.C. Reports", the University newspaper, is also distributed to all alumni and friends of the

University. Annual contributions to Alumni Annual Giving enable the Association to sponsor forty-two scholarships of \$350.00 each to high school students throughout the Province attending U.B.C. for the first time, assist the Library, athletics, and many other University projects of a special and unique character.

Further information can be obtained from Mr. Tim Hollick-Kenyon, Alumni Director, 252 Brock Hall, U.B.C., Vancouver 8, B.C.

UNIVERSITY SUMMER SESSION

The announcement of the courses, both credit and non-credit, to be offered in the summer session (approximately seven weeks in length), is issued in March, and is available on request from the Registrar.

The regulations, etc., governing the summer session are as follows:

1. The maximum credit for summer session work in any one calendar year is 6 units. Correspondence courses may not be taken concurrently.

2. Students are requested to register on or before April 1. No student will be permitted to register after June 1. A late registration fee of \$20.00 is assessed all registrants in the period May 11 - June 1.

3. All students desiring to obtain formal credit for work done in the summer session must be eligible for admission on the same basis as Winter Session students.

4. For statement of fees, see section on fees in this bulletin.

5. Summer session examinations are held at the close of the summer session.

6. Restriction on registration in the Summer Session:

- (a) A student who obtained *Fail* standing during the last Winter Session attended *may not* enrol in Summer Session.
- (b) A student in attendance at a secondary school during the previous winter *may not* enrol in the Summer Session.
- (c) The University reserves the right to reject applicants for the Summer Session whose previous academic records are unsatisfactory, even if they technically meet entrance requirements.

A number of non-credit courses are also given in Summer Session under the sponsorship of the Department of University Extension. Students interested may contact that Department for further information.

Summer Session Association

The Summer Session Association of the University of British Columbia is composed of all persons in attendance at the summer session. All students are required to pay a fee of \$2.00 at the time of registration.

This organization originated as a body to care for the extra-curricular, intellectual and social requirements of the summer session. Growth and expansion down through the years have made it of major importance on the campus.

The organization provides intellectual, social and recreational activities for both students and staff of the summer session. It deals with all matters pertaining to student welfare on the campus; it provides certain summer session scholarships for credit and non-credit courses, and has made available a considerable sum of money for interest-free student loans. The Executive Committee of the Association serves as a liaison group between the student body and the various governing bodies of the University.

The Summer Session Association holds two general meetings each summer. The Executive meets at least weekly during the summer and as often as is deemed necessary throughout the year.

EXTRA-SESSIONAL CLASSES

1. Extra-sessional classes in the evenings or late afternoons may be taken for credit, in certain subjects, by students proceeding to the B.A. or B.Ed. degree who are eligible for registration at least as Second Year students and who have the prerequisite standing. Certain courses for students qualified to proceed to the M.A. (in Education), M.Ed., or M.S.W. degree may also be available.

2. Only one extra-sessional course may be taken at a time.

3. Students attending the extra-sessional classes will normally be tested by the ordinary winter session examinations.

4. Regulations in respect to credit, standing, extra-mural work, examinations and supplementals are given in the appropriate Faculty calendars.

5. Correspondence and off-campus extra-sessional courses may be offered as prerequisites, but they are not acceptable for credit on a Master's programme.

6. Certain courses are open to a limited number of students who do not wish to take them for credit. *Non-credit students should register through the Extra-sessional Division of the Department of University Extension.* In all these courses the instructor rules on any non-credit student's eligibility to enter and to remain in the course. Students will be expected to maintain the same schedule of readings and written assignments as the regular students but will not need to write the final examination.

CORRESPONDENCE COURSES

University credit may be obtained in a number of fields by correspondence courses offered through the Department of University Extension. Although University regulations preclude a student from taking a full degree programme by this means, these courses will be valuable to teachers wishing to improve their qualifications during their teaching year, to persons who have had to interrupt their regular university attendance, or even to graduate students of this or other universities who may wish to take certain prerequisites in other fields of study. A Correspondence Course Syllabus is available from the Department of University Extension or from the Office of the Registrar.

Admission. Correspondence courses are open to applicants with full First Year University or College or Grade 13 standing, or to holders of a teacher's certificate. Students registered in the winter session of the University are not allowed to enrol in correspondence courses concurrently with winter session work or during the summers between successive winter sessions.

Registration. Applications for correspondence courses should be directed to the Office of the Registrar. Only one correspondence course may be taken at a time. Correspondence courses may not be taken concurrently with any other course work of the University. All courses must be completed within the time specified.

Certain courses (marked with an asterisk in the list of course offerings below) now run concurrently with the academic year. Registration in these must be completed before the beginning of the winter session in September. Registration for all other courses may take place at any time throughout the year.

Credit. Full degree credit is granted for correspondence courses. However, the maximum number of units of credit which may be taken by correspondence courses towards a degree is 15 units. The University will not grant credit for correspondence courses taken concurrently from another university.

Fees. Fees for a correspondence course are \$100.00 (subject to change without notice).

Examinations. Final examinations in correspondence courses may be written in April, August or December. Students who have successfully completed all course papers and assignments must notify the Office of the Registrar of the date and centre selected for their final examination. The Registrar of the University will endeavour to arrange the supervision of the examination at the centre selected by the student or an alternative centre conveniently located.

Standards in the final examinations will be the same as those for resident students. Students who fail in two final examinations in any one course will not be permitted to register again for that course.

Course Offerings

*Commerce 151, *Fundamentals of Accounting*; Economics 306, *Labour Economics and Industrial Relations*; Education 412, *Introduction to Adult Education*; English 200, *A Survey of English Literature*, *English 303 (formerly 300), *English Composition* (for students in the Faculty of Education only); English 321, *Approaches to Poetry*; English 392 (formerly 431), *Victorian Poetry*; *French 210, *Second Year University French*; *German 200, *Second Year German*; History 212, *History of the United States of America*; *History 413, *The Reformation*; Philosophy 100, *Introduction of Philosophy*; Political Science 200, *Democratic Government and Politics*; Psychology 100, *Introductory Psychology*; Psychology 301, *Developmental Psychology*.

Certain courses are open to a limited number of students who do not wish to take them for credit. Non-credit students should register through the Extra-Sessional Division of the Department of University Extension. In all these courses the instructor rules on any non-credit student's eligibility to enter and to remain in the course. Students will be expected to maintain the same schedule of readings and written assignments as the regular students but will not need to write the final examination.

Note: For non-credit diploma courses in the Faculty of Commerce and Business Administration, see the calendar for that faculty.

THE UNIVERSITY LIBRARY

The Library collections number over 700,000 volumes, including representative works in all fields in which the University gives instruction. The collection is strong in serial publications, including scholarly periodicals and transactions of learned and scientific societies; and in certain fields, notably Canadiana (including French-Canadiana), forestry, fisheries, Chinese literature and history, and Slavonic studies, the Library has rich holdings. The Howay-Reid Collection comprises the combined libraries of the late Judge F. W. Howay and the late Dr. Robie L. Reid, both of whom had assembled fine collections of Canadian history and literature. Other important collections in the field of Canadiana are the Pound Collection of Canadian literature, the A. J. T. Taylor Collection of materials pertaining to the Arctic, and the Thomas Murray Collection, recently secured with the help of Mr. Walter Koerner. Extensive holdings in the field of forestry have been obtained through the fund provided by Dr. H. R. MacMillan. The notable P'u-Pan Collection of Chinese history and literature, acquired on behalf of

the Friends of the University Library, is of international importance. The Asian Collection has been notably strengthened by the gift of the library of the Institute of Pacific Relations. Collections in other subject fields have been greatly enriched by purchases from funds provided by Mr. Walter Koerner, the Leon and Thea Koerner Foundation, the Friends of the University Library, the B.C. Packers Fund, Dr. H. R. MacMillan, and the Rockefeller and Carnegie foundations. Recent acquisitions of note are the Donaldson Collection of Burnsiana, purchased by the Friends of the Library in honor of Dr. and Mrs. N. A. M. Mackenzie, the Rockwoods Centre Library, a substantial personal library donated by Major-General Victor W. Odlum, and the Woodward Collection on the history of medicine and science, a gift of Mr. and Mrs. P. A. Woodward's Foundation.

The original section of the University Library building was erected in 1925. The north wing was added in 1948, and the south wing, named in honour of Mr. Walter C. Koerner, whose benefaction made it possible, was completed in 1960. The Library was extended and remodelled in 1964 to provide better services and additional book stacks.

A separate collection, designed to satisfy the needs of first and second year students, was established in the main library building in 1960 and named in honour of G. G. Sedgewick in 1965.

The Law Library came into existence together with the Faculty of Law in 1945 and is housed in the Law Building. The Curriculum Laboratory, which provides lesson aids and picture files for students in the Faculty of education, moved into its permanent quarters in the Education Building in 1962. The Woodward Biomedical Library, donated by the Mr. and Mrs. P. A. Woodward Foundation, began serving upper year students and faculty in 1964.

Library materials are to be found in twelve collections: the Main Stacks, Asian Studies, Sedgewick Library, Fine Arts, Government Publications, Map Room, Reserve Book Collection and Special Collections in the main library building; in the Curriculum Laboratory, the Law Library, Woodward Biomedical Library and the Biomedical Branch Library at the Vancouver General Hospital. In addition, a number of faculties have reading rooms containing selections of library books and journals.

The library system is organized in divisions: Acquisitions, Cataloguing and Serials provide technical services to the entire system. Circulation Division services the main stacks and provides for the lending and return of material. The subject divisions, Humanities, Science and Social Science, together with the collections, provide advisory and reference services and access to bibliographies, abstracts and indexes. An interlibrary loan service is maintained for graduate students and faculty who wish to consult materials in other libraries.

In 1965 a phonograph record lending and listening service was made possible by a gift from Dr. and Mrs. Wallace Wilson; listening facilities are available at no charge, and borrowing privileges for a modest fee.

Library Hours:

During the fall and winter sessions the University Library is open regularly from 8:00 a.m. until 10:00 p.m., Monday through Friday, and from 8:00 a.m. to 5:00 p.m. on Saturday: the Sedgewick and Woodward Libraries are open Monday through Friday until 12 p.m. and on Sunday afternoons. During the Summer Session, library hours are from 8:00 a.m. to 9:00 p.m., Monday through Thursday, and 8:00 a.m. to 5:00 p.m. on Friday; and at other times from 9:00 a.m. to 5:00 p.m., Monday through Friday. The Library is closed on Saturday during a three-month summer period.

Access to the general book stacks is permitted to students in their Third Year and upward, at all times, and to students in their first two years in the evenings and on week-ends. Study carrels and other facilities for special study are made available as far as possible. Microfilm, microcard, and micro-print reading machines are provided, and Xerox copies of library material can be obtained.

The collections and services of the Library, though maintained primarily for the students and Faculty of the University, may be utilized by persons outside the University who are engaged in studies which cannot be advantageously pursued in other libraries in the province. Persons who wish to qualify as "extra mural readers" must make application to the Librarian and are required to pay a fee of \$7.00 per calendar year.

Attention New Students:

A series of library guides, giving information about Library use, are available at the Main Loan Desk and in the subject divisions. Information desks are located in the Main, Woodward and Sedgewick Libraries and reference service is available at each subject division.

Library tours—September 12-16: Monday and Thursday, 1:00 p.m., 2:30 p.m., 4:00 p.m.; Tuesday, Wednesday, Friday, 10:00 a.m., 11:30 a.m., 1:00 p.m., 2:30 p.m., 4:00 p.m.

DEPARTMENT OF UNIVERSITY EXTENSION

Purpose

The aim of University Extension is to share the University's resources of faculty, staff and facilities with the community at large, as services and funds permit. University Extension is continuing higher education for adults, in accordance with the goals and standards of the University.

Programme Areas

The Department was formally organized early in 1936 under a grant from the Carnegie Corporation and has since developed a comprehensive and varied province-wide programme of University adult education.

- (1) **Credit**—University Extension is responsible for the administration of extra-session classes and correspondence courses. (For further details see under "Extra-Sessional Classes" and "Correspondence Courses".)
- (2) **Non-Credit**—The Department offers an extensive programme of evening classes, short courses, conferences and special lectures in professional areas and general studies.

- (a) **Professional and Technical**

The increasing rate of our acquisition of knowledge and the continuing rapid technological change in Canadian society have accentuated the need for adults to continue learning in their own fields of work. Recognizing this need, the Extension Department, in cooperation with faculties, schools and institutes, offers opportunities for continuing education in various professions and technical occupations. Continuing education programmes include: agriculture and fisheries; applied science; architecture; business and industry; education; forestry; health; pharmacy; social work; and town planning.

- (b) **General**

Programmes are offered to give the individual a greater knowledge of himself and his environment and an opportunity to develop

his intellectual abilities. These programmes are generally centred around the social and natural sciences, humanities and the fine arts. Special emphasis is given to programmes related to increasing public responsibility. Expansion in this area of liberal education has been made possible by a substantial grant from the Ford Foundation's Fund for Adult Education.

(c) Summer Session

As part of the University Summer Session the Department offers programmes in education, public affairs, the arts, and other subjects.

Programme Services

The following services support and extend the Department's offerings in Continuing Education:

(1) Office of Short Courses and Conferences

This office provides faculty and community with a complete administrative and advisory service for organizing and conducting residential and other courses.

(2) Audio-Visual Division

The division distributes, on a loan basis, an extensive collection of 16 mm sound motion pictures, projection equipment and filmstrips to interested individuals and organizations in B.C. and the Yukon.

Assistance is provided by film librarians in the selection of appropriate films or filmstrips to meet the specific needs of individuals or groups. Advice is available on film utilization techniques in order that maximum effect can be derived from the content of the film and to permit increased participation by the audience.

Films are available for a service charge; filmstrips on an annual registration fee. Catalogues are available on request.

This division is also an agent for the National Film Board of Canada, the Canadian Film Institute and serves as provincial library for films from the Consular offices of Australia and New Zealand, Austria, Britain and the Netherlands. In addition, a number of films in the library have been deposited by Canadian business and industrial firms.

Equipment is available for a service charge and projection equipment such as 8mm and 16mm motion picture projectors, 35mm and 3 1/4" x 4" slide projectors, opaque and overhead projectors, screens, tape recorders and record players may also be borrowed by individuals or organizations.

(3) The Speakers' Bureau

This office functions to assist community organizations in obtaining the services of faculty members, when appropriate, for off-campus lectures. Assistance from the bureau is available on a province-wide basis. Individual lectures are arranged in response to requests and considerable emphasis is given to arranging lecture series for professional and educational groups.

Diploma Program in Adult Education

The Faculty of Education and the Department of University Extension jointly offer a Diploma in Adult Education. This programme is designed for persons who wish to acquire the skills and knowledge required to organize, conduct, evaluate and generally administer programmes in adult education, but who, for a variety of reasons, do not wish to pursue a graduate degree. Such persons may be or wish to be, public school adult education directors, directors of training in business and industry and the like.

The programme is equal to approximately seven months of continuous study at the university but may be taken by summer session and extra-session courses as well as by full-time attendance at the university for one full academic year.

Further information concerning this programme may be obtained by writing to the Director, Diploma Programme in Adult Education, Extension Department, The University of British Columbia, Vancouver 8.

Full particulars regarding any of the above services will be furnished upon application to the Department of University Extension.

COMPUTING CENTRE

The facilities of the Computing Centre are available for research and teaching. The staff of the Centre is responsible for the teaching of programming (mainly FORTRAN), for consultation, for some programme development, and for the library of available programmes. Key punching and operator services are also provided. A pick-up and delivery service for computer input and computer results is provided twice daily at several points on campus. Key punches are situated at these points to facilitate correction of programme.

The Computing Centre presently has an IBM 7040 computer with 32,000 words of memory, full instruction set, and 6 magnetic tape units (729V) and one 1301 disk file on two overlapped data channels. Paper tape input and plotter output is provided off line. One remote input/output is situated in the Henry Angus building on experimental basis.

STAFF PERSONNEL, LABOUR RELATIONS AND ANCILLARY SERVICES

Office of Labour Relations and Personnel

The University Personnel Office, situated on the corner of West Mall and Memorial Road, has the following functions for the non-teaching staff of the University: recruitment and selection; recommendation of policy concerning wages, hours and working conditions; practices as to employee benefits; job evaluation and classification; maintenance of staff records. In addition, the Director serves as Chairman of the Negotiating Committee for negotiating of contracts between the University and all labour unions represented at the University, is responsible for the drawing up of such contracts and the execution of the terms of such contracts where they apply.

Office of Ancillary Services

The Director of the Office of Ancillary Services is responsible for the general administration and financial functioning of the following services: Food Services, Book Store, Patrol and Parking, Mail Service, Post Office, and Office Services. All inquiries should be directed to the Director.

INFORMATION OFFICE

This office provides comprehensive information to the public about the University by arranging interviews with the news media, promoting participation in television and radio, and by written releases to all potential news outlets. *UBC Reports* is published frequently and distributed to 40,000 alumni, friends of the University and students. Assistance and advice is readily available upon request in any area that can serve the University.

UNIVERSITY SERVICE TRAINING CORPS

Selected students may take training in the University Naval Training Division (U.N.T.D.), the Canadian Officers' Training Corps (C.O.T.C.), or the R.C.A.F. (Reserve) University Squadron (R.U.S.). All service training on the campus is under the jurisdiction of a Joint Services University Training Committee under the chairmanship of Professor H. M. McIlroy of the University of British Columbia and composed of the Commanding Officers of the U.N.-T.D., C.O.T.C. and R.U.S., and the Armed Forces Officer at the University. The one drill night per week, required by R.O.T.P. and reserve cadets is carried out in the Armouries on the University campus.

(a) Reserve Training

Enrolment in these reserve contingents is open to applicants who are Canadian citizens or British subjects with the status of "landed immigrant". They must be medically fit and have a sound academic background.

The training programme consists of 64 hours of lectures, films and parade training commencing in September and continuing for one night a week throughout the academic year. Twenty-five hours of instruction are tri-Service in content. Cadets must train 15 weeks during each of their first two summers with their respective services. A few cadets will be selected for third year training. Those not selected will be placed on the Reserve Retired List or released; those selected will continue training during the third academic year and 12 weeks of the third summer.

During the winter months cadets may receive pay equivalent to 16 full days for attendance on training nights, or a maximum of \$133.00. During their summer training, cadets receive pay at the rate of \$250.00 per month plus transportation, travelling expenses, rations, quarters and medical services. They are issued with the required uniforms. Further detailed information may be obtained from any of the Resident Staff Officers at the University of British Columbia.

(b) Regular Officer Training Plan

A number of young men who are interested in the Regular Force as a career, are accepted each year as R.O.T.P. officer cadets. They may be high school graduates or university students in any undergraduate year. Undergraduates enrolled in the Service of their choice continue in university until graduation. They take their winter training with the Reserve Cadets and their summer training in their respective Services. Application for admission is normally made before 1 July in the year of entrance but there is a further opportunity to join through the University Liaison Programme halfway through the academic year. Under the R.O.T.P., tuition and books are paid for and an allowance of \$143.00 per month is paid during the winter training. In the summer months, R.O.T.P. cadets receive \$78.00 per month plus room and board. The R.O.T.P. cadet must undertake to serve a minimum of four years in the Regular Force following graduation.

(c) 45-month Subsidization Plans

In addition to the R.O.T.P., there are Canadian Forces 45-month Subsidization Plans for medical and dental undergraduates. Undergraduates who accept aid under these plans must serve in the Regular Force for three years for medical graduates and five years for dental graduates.

Armed Forces Office

A Services Office is maintained at the University of British Columbia in the Armouries Building (phone: CA 4-3313), and is staffed by Permanent

Force officers. These officers give guidance and assistance to all university students seeking advice and direction on the various scholarship Undergraduate Subsidization Plans sponsored by the Canadian Forces. The Senior Staff Officers also acts in an advisory capacity on Department of National Defence matters, to the University, the University Reserve Units' Commanding Officers and to individuals who are interested in pursuing either a full-time career in one of the Services or desiring to participate in one of the reserve programmes.

Selection Procedure

Once a year Permanent Force officers from the Canadian Forces Recruiting Centre, 547 Seymour St., Vancouver, visit the University and interview undergraduates who have made appointments through the University Placement Office. The visiting officers, who work closely with the University Armed Forces Office, interview the applicants as to their suitability for the Regular Officer Training Plan or commissioned rank in the Canadian Forces, and make recommendations to National Defence Headquarters. Prior announcements of their visit and interview times are placed in the campus newspaper. However, application can be made any time during the academic year.

UNIVERSITY RELIGIOUS COUNCIL

The Council is a Senate Committee whose functions are to co-ordinate and supplement activities of religious organizations on the campus, to provide opportunities for liaison among the University, the Chaplains, and the student religious clubs, and to act as a forum for the discussion of problems of religious organizations on the campus. Its membership includes all the Chaplains, Religious Advisers to student clubs, representatives of the teaching Theological Colleges on the campus, representatives from each of the student religious clubs, and a number of members of faculty appointed by the President. Its Chairman is at present the Rev. C. R. Pearson (Lutheran Chaplain). The clubs represented in the Council arrange studies of various aspects of religion under their own auspices, and from time to time the Council, either itself, or in conjunction with one of the clubs, sponsors meetings of wider interest.

The attention of interested students is also drawn to the courses offered in Religious Studies (see the Faculty of Arts calendar), and to the Religious Knowledge Options available to students who have expressed their intention of proceeding to ordination. From time to time courses are offered on a non-credit basis by the Department of University Extension. Certain courses of similar interest may also be taken in the Departments of Anthropology and Sociology, English and Philosophy.

Students are invited to consult the following Chaplains, whose services are offered on a voluntary basis: Rev. David Bauer, C.S.B. (Roman Catholic), Rev. Herbert S. Fox, B.A. (Lutheran Church, Missouri Synod), Rev. Bernice M. Gerard, B.A. (Pentecostal Assemblies of Canada), Rev. J. Alan Jackson (Anglican), Rev. C. Robert Pearson, B.A., B.D. (Canadian Lutheran Council), Rev. Joseph I. Richardson, B.A., B.D., S.T.M. (Baptist), Rev. J. A. Ross, M.A., B.D., Ph.D. (Presbyterian); Rev. John Shaver, B.A. (United Church), and Rabbi W. Solomon (Jewish).

PUBLICATIONS CENTRE

Canadian Literature

Canadian Literature: A Quarterly of Criticism and Review is a magazine published officially by the University. It is devoted to the critical, historical

and biographical study of literature in Canada, and to the systematic reviewing of new Canadian books. It publishes articles in both English and French, and each year issues a bibliography of books and essays in the field of Canadian literature. The subscription to *Canadian Literature* is \$3.50 per annum (single copies \$1.25 each). Contributions should be sent to the Editor and subscriptions to the Circulation Manager, UBC Publications Centre, Auditorium.

George Woodcock, Editor. D. G. Stephens, Associate Editor.

Pacific Affairs

Pacific Affairs: An International Quarterly Review of the Far East and Pacific Area. Formerly the quarterly organ of the Institute of Pacific Relations from 1928 to 1960, *Pacific Affairs* has been published since March 1961 under the auspices of the University. It is devoted mainly to contemporary political, economic, social and diplomatic problems of eastern and southern Asia, the South Pacific, and to the relations of the Western world with Asia. It publishes articles, notes and comment and book reviews by a wide range of writers from many countries. The subscription is \$5.00 per annum (single copies \$1.50). Contributions should be sent to the Editor and subscriptions to the Circulation Manager, UBC Publications Centre, Auditorium.

William L. Holland, Editor. Mary F. Healy, Associate Editor.

Prism international

Prism international is a quarterly magazine devoted to the publication of poetry, fiction, drama and other types of imaginative literature. Founded as Prism in 1959, its first three volumes were edited by a group of young Vancouver writers who formed a private society to publish it. In 1964 the journal came under the sponsorship and partial support of the University, and its editing became the responsibility of the Creative Writing Department. Editorial policy was broadened to include publication of works in translation, together with texts in the original languages. The four issues of Volume Four (1964-65) presented newly translated poetry by contemporary Japanese, Tamil, Philippine and Italian writers, as well as work in various genres by British, American and Canadian authors.

The subscription is \$3.50 a year (single copies \$1.00) in all countries. Submissions should be sent to the Editor, and subscriptions to the Circulation Manager, in care of the Creative Writing Department, University of British Columbia.

Earle Birney, Editor.

Cherie Smith, Circulation and Advertising Manager.

Canadian Yearbook of International Law

The first two volumes of this new annual have been published: Vol. I, 1963, \$8.50; Vol. II, 1964, \$10.00. Professor Charles B. Bourne of the U.B.C. Law Faculty is editor. Orders for either volume should be sent to the Publications Centre, U.B.C. Auditorium. Volume III is scheduled for fall 1965.

Books

The Centre also publishes a number of scholarly books. Among the recent ones are: *History of Public Education in British Columbia* by Professor F. Henry Johnson of the U.B.C. Faculty of Education, \$6.50; *Malaysia* by K. G. Tregonning, \$2.50; *The Communist Party of Indonesia* by Justus M.

Van der Kroef, \$7.50; *Asian Policy of the Philippines* by J. L. Vellut. In press; *Canada and the European Common Market* by William Hughes, \$1.00; *The Third China—The Chinese Communities in South-East Asia* by C. P. Fitzgerald, \$2.75; etc. A full list of available titles and other information may be obtained from Room 312 in the Auditorium.

MUSEUMS

These consist of (1) the Anthropological Museum, housed on the first floor of the Library; (2) the Geological Museum, in Room 116, the adjoining hall and in Room 119, Forestry and Geology Building; (3) the Zoological Museum, housed in various rooms of the Biological Sciences Building; (4) the Botanical Collections and Herbaria.

The **Anthropological Museum** containing about 25,000 catalogued items includes the Burnett and Raley collections as well as others; the Buttimer and other collections of Indian baskets; the Michell Pierce collection of Eskimo clothing and utensils. The Burnett Collection was made by the late Frank Burnett who donated it. It contains groups of artifacts representative of the ethnology and archaeology of various parts of the Pacific Basin. The largest unit is from Melanesia, but Indonesia and North and South America are also strongly represented.

The collections made by Dr. G. H. Raley and the Rev. E. M. Collison, and donated by Dr. H. R. MacMillan, are especially full in artifacts from Kitimat and the Queen Charlotte Islands. An unusually rich collection of ceremonial material from the Southern Kwakiutl has been donated by Dr. MacMillan.

A grant from the Leon and Thea Koerner Foundation made possible the purchase of a collection of Egyptian and classical materials from the Baroness K. van Haersolte van den Doorn. The classical collection has been greatly enhanced by the Sid Leary Memorial Collection of artifacts from Cyprus and Crete.

The Fyfe-Smith collection of traditional Japanese arts and crafts and the Clegg collection of works of art, costumes and textiles form a nucleus of Japanese materials. Two additional gifts have supplemented this, one from the Prefectural Trade Association of Japan, and one from the Fujiwara Trading Company. A collection from Okinawa was made by Dr. Wayne Suttles in 1954, and one from Japan by R. P. Dore in 1958.

Some important acquisitions have been made of Chinese ceramics ceremonial objects, costumes and textiles, supported by grants from the Leon and Thea Koerner Foundation.

The **Geological Museum** is designed for the visual instruction of students and visitors and is closely coordinated with the teaching of the Department of Geology.

There are on exhibit ten table-cases of minerals in systematic arrangement; a case of fluorescent minerals; a case of meteorites; two table-cases of ore specimens from well-known mines; eight table-cases of fossils representing the geological periods; three standing cases of prehistoric fishes, reptiles, birds and mammals. A table-case represents the primates and early man. Other exhibits include Pleistocene mammal remains from the placer gravels of Yukon and Alaska, the skull and antlers of an Irish elk and fine modern game heads.

In the study material, the Sutton collection includes over 800 mineral species from 4036 localities. Its thousands of specimens are systematically arranged in readily accessible trays. Many trays of rock represent various parts of Canada, Hong Kong and elsewhere. Upwards of 500 trays of fossils

represent work done by students and staff over the past 35 years in Canada, Hong Kong and other places.

Of special interest are a geological model of the Assynt Mountains of Scotland by Peach and Horne, and a fine mounted hooded dinosaur, *Lambeosaurus* sp. from Steeveville, Alberta, on permanent loan from the National Museum, Ottawa.

The Zoological Museum contains material representative of both the vertebrate and invertebrate fields. It is housed in several rooms in the Biological Sciences building. The collection of marine invertebrates of the north-eastern Pacific Ocean is steadily increasing in size and includes the Fraser collection of hydroids of the world. The collection of vertebrates exclusive of fish now numbers about 12,600 specimens of birds, 9,200 mammals, and 1100 amphibians and reptiles. Important recent collections have been added from the west coast of Mexico as a result of the Marijean expeditions to this area in 1957 through to 1966 under the sponsorship of Dr. H. R. MacMillan.

The George J. Spencer Entomological Collection now numbers about 400,000 specimens. The most notable additions recently have been the Stace-Smith collection of Coleoptera and the Downes collection of Hemiptera and Homoptera.

The ichthyological collection occupies some 1000 feet of shelving in the Biological Sciences Building. The museum contains an unrivaled collection of freshwater fishes from north-western North America and of marine fishes from the North Pacific Ocean and Bering Sea, including Japanese waters. Tropical marine fishes from the eastern Pacific, particularly the offshore islands, are well represented, and there are some collections from Southeast Asia. By December 1963 the museum contained about 9000 catalogued collections comprising about 3000 species.

The limnological collection, in addition to standard physical and chemical information, contains a large number of plankton and bottom fauna samples from several hundred lakes in British Columbia.

The Herbaria consist of permanent reference and research collections of dried plant specimens housed in cases in the Biological Sciences Building. All groups from the algae to the flowering plants are represented.

The total number of flowering plants and ferns is about 115,000 sheets. An effort is being made to preserve in this collection all species known to occur in the province. Its value in this regard has been greatly augmented through the donation by Mr. J. W. Eastham of several thousand B.C. specimens. In addition it contains a number of smaller collections by other botanists working in the province as well as considerable material from other parts of North America, and from Europe, South Africa, the Hawaiian Islands, New Zealand and Australia.

The Phycological Herbarium comprises over 40,000 specimens of marine algae. It is rich in species from British Columbia, Washington, Oregon and Alaska. Collections were made in research projects supported in part by grants from the National Research Council and the Defense Research Board to the Institute of Oceanography and the Department of Biology and Botany.

In the Mycological Herbarium are over 10,000 specimens of fungi. This includes an excellent collection of Myxomycetes as well as representatives of most groups of true fungi.

The Bryophyte Herbarium contains the largest and most complete collection of British Columbia bryophytes in existence. It is well represented by material from Japan and Western Europe. The collection has been built

as a direct result of sponsorship by National Research Council. The Herbarium of bryophytes and lichens contains over 45,000 specimens.

The collections are freely available to students and research institutions.

THE FINE ARTS GALLERY

The Art Gallery, located in the Library and approached through the north entrance door, was opened in December, 1948. It was established by and has been supported with the generous assistance of the University Chapter of the I.O.D.E. and others as a memorial to the late Dean Mary L. Bollert.

The Art Gallery has no permanent collection but maintains a continuous display of loan exhibitions. These are rented or borrowed from the National Gallery, the Museum of Modern Art, the Western Canada Art Circuit, the Western Association of Art Museums, the Smithsonian Institution and other galleries and circuits. Other shows are exhibited on the invitation of the Art Gallery, by local and other artists, art organizations and institutions. Because it has these numerous sources of material, the Gallery is able to bring to the University a wide variety of exhibitions which are representative of the principal trends in art. Many of the exhibitions are accompanied by explanatory talks given by the artists concerned, the Curator and other members of Faculty, and by discussions.

The Gallery is under the supervision of the Curator and is open from 10:30 a.m. to 5:00 p.m., Tuesday through Saturday, and from 7:00 to 9:00 on Tuesday evenings.

FACILITIES FOR SPORTS AND ATHLETICS

Stadium and Playing Fields

The original playing field area, about 13 acres, is situated east of the East Mall and north of the University Boulevard. Development work was started early in January, 1931, and was made possible through funds provided chiefly by subscriptions from the faculty, students and friends of the University.

The William Eugene MacInnes Field is situated in an area northeast of the War Memorial Gymnasium. This field was made possible by contributions from Mr. and Mrs. W. H. MacInnes in memory of their son, a graduate of this University in the combined course of Arts and Mining Engineering.

The Chris Spencer Field, constructed in 1957, was made possible by the generosity of the Chris Spencer Foundation, supplemented by contributions from friends of the University interested in cricket and grass hockey.

The Wolfson Field, constructed in 1961, consists of approximately 7 acres located to the south of Agronomy Road. This area was developed as the result of a gift from the Wolfson Foundation of London, England, made through the British Columbia Playing Fields Association. An additional 15 acres of playing fields, to the south of the Wolfson Field, were put into use in September, 1964. This area is now called the Thunderbird Fields. Farther south a third set of fields consisting of 20 acres, including an all-weather track, is being developed. This complex, will include a new cricket pitch, and will in the future be called the Chris Spencer Field. It will be put into use in the summer of 1966.

The first section of the grandstand for the stadium, a covered reinforced concrete structure, erected in the summer of 1937 on the west side of the main playing field, seats 1600 spectators. During the fall of 1954, 2700 semi-

permanent seats were moved from the Swimming Pool and erected in the Stadium. Underneath the present main stand there are locker rooms, dressing rooms, showers, etc. Funds for the construction of the grandstand were provided through a \$40,000 bond issue sponsored by the Alma Mater Society. A television gondola, suspended from the roof supports, was added in November, 1954.

The School of Physical Education and Recreation also uses certain temporary accommodation for dance classes and recreational activities. An air-force hangar brought to the campus in the fall of 1946, and reconstructed as an athletic Field House in January, 1948, is used for archery, badminton, golf, tennis, as well as track and field and various team practices.

Women's Gymnasium

This building was completed in 1929 and presented to the University by the Alma Mater Society.

War Memorial Gymnasium

The Memorial Gymnasium was officially dedicated on October 26, 1951. This building, which cost almost \$800,000, was the result of a student-alumni campaign to honour the men and women of British Columbia who served in World Wars I and II. It was financed by public subscriptions, a Provincial Government grant, and in major degree by a special student levy.

Swimming Pool

During 1954 an open-air swimming pool was built adjoining the Memorial Gymnasium to provide for the swimming and diving events of the British Empire and Commonwealth Games held during the first week of August. A gift from the British Empire and Commonwealth Games Canada (1954) Society, the pool is 50 feet wide and 165 feet long. Under the 10-metre diving tower the water is 16'6" deep. During the Games the pool was surrounded by 6000 seats.

Education Gymnasium

In 1961 a small teaching gymnasium was built by the University for the Faculty of Education. It is located adjacent to the stadium grandstand.

Winter Sports Centre

A Winter Sports Centre, consisting of a hockey rink with an ice surface of 200 feet by 85 feet surrounded by seating accommodation for 1284, a curling area with six sheets of ice, and a lounge and snack bar, was opened officially on October 25, 1963. The Centre, constructed at a cost of \$500,000.00, was made possible by generous donations from the Alma Mater Society, the University, the Molson Foundation, and the support of the Federal-Provincial Winter Works Programme. It is operated by the Winter Sports Centre Management Committee which is comprised of two representatives of the University, two of the Alma Mater Society, and two of the residents of the adjoining residential area.

INTERNATIONAL HOUSE

International House at the University of British Columbia was officially opened on March 4, 1959 by the late Mrs. Eleanor Roosevelt. Its ideal is shared by all International Houses as expressed in the motto, "That Brotherhood May Prevail".

International House is a non-residential centre. Through its varied programmes and services, Canadian and foreign students alike have an opportunity to develop international friendships and thereby extend their knowledge and understanding of other countries.

PERMANENT BUILDINGS

The following listing gives the permanent buildings and the dates of their completion: 1925—Science (Chemistry), Library, Power House. 1937—Stadium. 1947—Physics (Hennings). 1948—Library, North Wing. 1949—Home Economics. 1950—Biological Sciences, Engineering. 1951—Mary Bollert Hall, Isabel MacInnes Hall, Ann Wesbrook Hall (women's residences), Wesbrook, Law. 1954—Memorial Pool, Memorial Gymnasium, Physical Metallurgy. 1956—Brock Hall Annex, Women's Residence Unit No. 5. 1958—International House, Buchanan Building (Arts). 1959—Chemistry South Wing, Extension to Biological Sciences, Robson House, Kootenay House, Okanagan House (men's residences), Faculty Club. 1960—Sherwood Lett House (men's residence), Gordon Shrum Commons (a central social and dining hall), Walter C. Koerner Wing to the Library, George Cunningham Pharmacy building, Extension to Buchanan. 1961—Chemical Engineering, Thea Koerner Graduate and Social Centre, three units—Medical Sciences, Aldyen Hamber House, Dorothy Mawdsley House, Margaret MacKenzie House, Phyllis Ross House (women's residences), Power House extension. 1962—Chemistry extension, Lasserre building, First unit—Education. 1963—Commissary Kitchen, Chemistry East Wing, Winter Sports Centre, Frederic Wood Theatre, Physics (Hebb) extension. 1964—MacLeod Electrical Engineering, Woodward Library (Medicine), Dene and Nootka Houses (women's residences), Haida and Salish Houses (men's residences), Totem Park Common Block. 1965—Henry Angus Building for Commerce and Social Sciences. Under Construction—Forestry—Agriculture: Dentistry; Medical Sciences Additions. Planned for Construction in 1966—Music, Metallurgy, Bio-Sciences, Psychiatry Wing of Health Sciences Centre.

UNION COLLEGE OF BRITISH COLUMBIA (United Church of Canada)

Vancouver 8, B.C.

(In affiliation with the University of British Columbia)

Principal

REV. W. S. TAYLOR, M.A., B.D., Ph.D., D.D.

Registrar

REV. PROFESSOR S. V. FAWCETT, B.A., B.D., Th.D.

Dean of Residence

REV. PROFESSOR R. A. WILSON, M.A., B.D., Ph.D.

Union College offers courses of instruction in Theology leading to a diploma in Theology, and to the degrees of B.D., B.Th., and S.T.M., and under the general regulations of the University with reference to affiliated Theological Colleges, provides Religious Knowledge options, for which credit is given in the course leading to the B.A. degree.

A six-week Summer Session each year, concurrent with the University Summer Session, offers courses for credit toward Graduate degrees, with lectures by members of the College Faculty and visiting Professors.

For further information in reference to Faculty, courses of study, etc., see Calendar of Union College.

THE ANGLICAN THEOLOGICAL COLLEGE OF
BRITISH COLUMBIA

Vancouver 8, B.C.

(in affiliation with the University of British Columbia)

Principal and Dean of Theology

THE REVEREND J. BLEWETT, B.A., B.D., D.D.

Registrar

THE REVEREND CANON T. BAILEY, M.A., B.D.

Librarian

THE REVEREND BRIAN COOPER, M.A.

The Anglican Theological College offers courses in Theology leading to the title of Licentiate in Theology, and the degrees of S.T.B. and S.T.M., and, under the general regulations of the University in reference to affiliated colleges, provides Religious Knowledge options, for which credit is given in the course leading to the B.A. degree.

For further information in reference to Faculty, course of study, etc., see Calendar of the College.

ST. MARK'S COLLEGE

(Roman Catholic)

Vancouver 8, B.C.

(In affiliation with the University of British Columbia)

Principal

REV. E. CARLISLE LEBEL, C.S.B., C.D., M.A., LL.D.

Registrar

REV. N. KELLY, C.S.B., M.A.

St. Mark's College will offer graduate degrees in theology distinct from courses directed to the ministry and, under the general regulations of the University with reference to affiliated Theological Colleges, offers Religious Knowledge options for which credit is given in the courses leading to the B.A. degree.

As a residential college, St. Mark's provides accommodation for 103 University men students, with a view to developing a community of thought and interests among students, scholars and priests who are professionally involved in the various departments and faculties of the University. During Summer Session, the residence facilities are available to women students only.

St. Mark's is also a centre for students at the University seeking the relation between the wisdom of the Church and their other intellectual and social aspirations.

For further information, see the calendar of the College.

ST. ANDREW'S HALL

(The Presbyterian Church in Canada)

Vancouver 8, B.C.

(In affiliation with the University of British Columbia)

Dean of Residence

Rev. J. A. Ross, M.A., B.D., Ph.D.

This men's residence provides on-campus dormitory, dining-room and chapel facilities for forty-two students during both winter and summer sessions. Application forms should be requested and filed well in advance.

CAREY HALL

(Baptist Federation of Canada)

Vancouver 8, B.C.

(In affiliation with the University of British Columbia)

Dean of Residence

Rev. J. I. RICHARDSON, B.A., B.D., S.T.M.

Carey Hall is a Men's Residence which accommodates 42 students, mostly in single rooms. During the summer session only, half of the accommodation is available for women students. Further information and application forms will be sent on request.

THE BRITISH COLUMBIA RESEARCH COUNCIL

The British Columbia Research Council is an independent non-profit, industrial research organization. Its work is in applied fields of direct interest to industry.

The Council cooperates with the National Research Council in providing a free technical information service, and is one of the few agencies in Canada which undertakes contract research on a confidential basis. Included in its activities are product and process development, economics and market research, operations research, and trouble-shooting.

The Council has a total staff of 88, of which 49 are professional scientists, engineers and economists. Close cooperation is maintained with the science, engineering and other related departments of the University.

FOREST PRODUCTS LABORATORY

The Vancouver Laboratory is a unit of the Department of Forestry, Canada, and is maintained by the Federal Government for the conduct of research in wood products. The Laboratory is housed in a modern building at 6620 N.W. Marine Drive, west of the Ponderosa Cafeteria. This building was occupied in March, 1958, and consists of an administrative wing built almost entirely of British Columbia woods and a laboratory wing in which Douglas Fir glulam beams are a construction feature.

REGISTRATION 1965-66
(as of December 1, 1965)

FACULTY OF ARTS

Arts	<i>Men</i>	<i>Women</i>	<i>Total</i>
First Year	721	698	1419
Second Year	758	557	1315
Third Year	586	402	988
Fourth Year	542	348	890
Total	2607	2005	4612

Music

First Year	27	28	55
Second Year	23	21	44
Third Year	18	18	36
Fourth Year	19	24	43
Total	87	91	178

School of Home Economics

First Year	—	94	94
Second Year	—	60	60
Third Year	—	47	47
Fourth Year	—	56	56
Fifth Year	—	1	1
Total	—	258	258

School of Librarianship**School of Social Work**

B.S.W.	51	49	100
M.S.W.	34	32	66
Total	85	81	166

TOTAL IN FACULTY	2800	2503	5303
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FACULTY OF SCIENCE

First Year	918	200	1118
Second Year	673	126	799
Third Year	536	82	618
Fourth Year	456	69	525

TOTAL IN FACULTY	2583	477	3060
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FACULTY OF APPLIED SCIENCE**Engineering**

First Year	328	1	329
Second Year	246	—	246
Third Year	208	1	209
Fourth Year	165	1	166
Total	947	3	950

	Men	Women	Total
School of Architecture			
First Year	41	2	43
Second Year	23	1	24
Third Year	28	—	28
Fifth Year (old)	3	—	3
Total	<u>95</u>	<u>3</u>	<u>98</u>
School of Nursing			
Basic Degree Programme			
First Year	—	34	34
Second Year	—	22	22
Third Year	—	24	24
Fourth Year	—	22	22
Total	<u>—</u>	<u>102</u>	<u>102</u>
Postbasic			
First Year	1	20	21
Second Year	—	13	13
Third Year	—	8	8
Total	<u>1</u>	<u>41</u>	<u>42</u>
Diploma Course	5	69	74
TOTAL IN FACULTY	<u>1048</u>	<u>218</u>	<u>1266</u>
FACULTY OF AGRICULTURE			
First Year	33	10	43
Second Year	47	11	58
Third Year	36	13	49
Fourth Year	45	6	51
Occupational Course	1	1	2
TOTAL IN FACULTY	<u>162</u>	<u>41</u>	<u>203</u>
FACULTY OF LAW			
First Year	119	3	122
Second Year	97	2	99
Third Year	81	4	85
TOTAL IN FACULTY	<u>297</u>	<u>9</u>	<u>306</u>
FACULTY OF PHARMACY			
First Year	13	15	28
Second Year	30	12	42
Third Year	18	10	28
Fourth Year	33	13	46
TOTAL IN FACULTY	<u>94</u>	<u>50</u>	<u>144</u>

FACULTY OF MEDICINE	<i>Men</i>	<i>Women</i>	<i>Total</i>
First Year	49	10	59
Second Year	54	2	56
Third Year	49	7	56
Fourth Year	53	2	55
Total	<u>205</u>	<u>21</u>	<u>226</u>
School of Rehabilitation Medicine			
First Year	3	30	33
Second Year	—	25	25
Third Year	—	32	32
Total	<u>33</u>	<u>87</u>	<u>90</u>
TOTAL IN FACULTY	<u>208</u>	<u>108</u>	<u>316</u>
FACULTY OF DENTISTRY			
First Year	8	—	8
Second Year	6	—	6
TOTAL IN FACULTY	<u>14</u>	<u>—</u>	<u>14</u>
FACULTY OF FORESTRY			
First Year	77	—	77
Second Year	45	—	45
Third Year	36	—	36
Fourth Year	41	—	41
TOTAL IN FACULTY	<u>199</u>	<u>—</u>	<u>199</u>
FACULTY OF EDUCATION			
Elementary Division			
First Year	25	300	325
Second Year	75	525	600
Third Year	80	386	466
Fourth Year	70	170	240
Graduates	30	33	63
Total	<u>280</u>	<u>1414</u>	<u>1694</u>
Secondary Division			
First Year	79	61	140
Second Year	131	89	220
Third Year	117	79	196
Fourth Year	116	44	160
Fifth Year	67	31	98
Graduates	165	72	237
Industrial Arts	69	—	69
Total	<u>744</u>	<u>376</u>	<u>1120</u>

School of Physical Education	Men	Women	Total
First Year	22	31	53
Second Year	70	21	91
Third Year	43	15	58
Fourth Year	38	13	51
Total	<u>173</u>	<u>80</u>	<u>253</u>
TOTAL IN FACULTY	1197	1870	3067

FACULTY OF COMMERCE AND BUSINESS ADMINISTRATION

First Year	285	10	295
Second Year	228	9	237
Third Year	210	5	215
Fourth Year	140	3	143
TOTAL IN FACULTY	<u>863</u>	<u>27</u>	<u>890</u>

FACULTY OF GRADUATE STUDIES

Course leading to: Ph.D.	410	44	454
D.Ed.	7	3	10
M.A.	260	148	408
M.Sc.	209	28	237
M.A.Sc.	98	—	98
M.Arch.	1	1	2
M.S.A.	27	1	28
M.B.A.	53	1	54
M.F.	10	—	10
M.P.E.	10	1	11
M.Ed.	18	18	36
M.S.P.	5	3	8
M.Mus.	2	—	2
LL.M.	1	—	1
TOTAL IN FACULTY	<u>1111</u>	<u>248</u>	<u>1359</u>
Unclassified	140	70	210
GRAND TOTAL	10,716	5,621	16,337

Extra-Sessional Classes	701	840	1541
Correspondence Courses	439	622	1061
Summer Session 1964	3206	3024	6230

DEGREES CONFERRED

1965

Spring Congregation:

May 27 and 28: D.Litt.—1; LL.D.—3; D.Sc.—2; Ph.D.—22; M.A.—55; M.B.A.—7; M.S.W.—41; M.Sc.—28; M.A.Sc.—10; M.S.A.—8; M.F.—2;

M.P.E.—3; M.Ed.—15; B.S.W.—82; B.L.S.—52; B.A.—620; B.H.E.—40; B.Mus.—20; B.Com.—111; LL.B.—60; B.S.A.—36; B.A.Sc.—170; B.Arch.—12; B.S.N.—32; B.Ed.—220; B.P.E.—21; B.S.F.—40; M.D.—42; B.S.P.—28; B.Sc.—332; M.S.P.—2; Total—2109.

Fall:

November 4: Ph.D.—31; M.A.—30; M.Sc.—25; M.A.Sc.—17; M.S.A.—5; M.F.—2; M.B.A.—3; M.S.P.—1; M.P.E.—1; M.Ed.—49; M.S.W.—2; B.S.W.—6; B.L.S.—1; B.A.—192; B.H.E.—5; B.Mus.—6; B.Sc.—71; B.A.Sc.—11; B.Arch.—6; B.S.N.—2; B.S.A.—5; B.S.P.—2; M.D.—1; B.S.F.—3; B.Com.—21; B.Ed.—352; B.P.E.—19; Total—869.

1966-67

**THE FACULTY
OF
AGRICULTURE**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Agriculture calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's Office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

BLYTHE EAGLES, B.A. (Brit. Col.), M.A., Ph.D. (Toronto), F.C.I.C., F.A.I.C., F.R.S.C., Professor and Dean of the Faculty.

Department of Agricultural Economics

MICHAEL J. DORLING, B.Sc. (Reading), Diploma (Ag. Econ.) (Oxford), M.S. (Iowa State), Ph.D. (McGill), Assistant Professor.

COOLIE VERNER, A.M. (William and Mary), M.A., Ed.D. (Columbia), A.Hum. (Hon.) (Andrew Coll., Georgia), Professor of Adult Education.

Department of Agricultural Mechanics

T. L. COULTHARD, B.E. (Sask.), M.Sc. (Calif.), P.Eng., Professor and Chairman of the Department.

E. L. WATSON, B.A.Sc. (Brit. Col.), M.Sc. (Calif.), P.Eng., Associate Professor.

L. M. STALEY, B.A.Sc. (Brit. Col.), M.Sc. (Calif.), P.Eng., Associate Professor.

Division of Animal Science

BLYTHE EAGLES, B.A. (Brit. Col.), M.A., Ph.D. (Toronto), F.C.I.C., F.R.S.C., F.A.I.C., Professor of Dairying and Chairman of the Division.

J. C. BERRY, M.S.A. (Brit. Col.), Ph.D. (Iowa State), Professor of Animal Husbandry.

C. D. MACKENZIE, M.S.A. (Brit. Col.), Ph.D. (Aberdeen), Professor of Animal Husbandry. (On leave).

W. D. KITTS, M.S.A. (Brit. Col.), Ph.D. (Iowa State), Professor of Animal Husbandry.

G. J. OKULITCH, M.S.A. (Brit. Col.), Honorary Lecturer in Dairying.

Division of Plant Science

V. C. BRUNK, M.S.A. (Brit. Col.), Ph.D. (Wisconsin), Professor of Agronomy and Chairman of the Division.

C. A. HORNBY, M.S.A. (Brit. Col.), Ph.D. (Cornell), Associate Professor of Horticulture.

J. W. NEILL, M.C., B.S.A. (Toronto), Ph.D. (Oregon State), Associate Professor of Horticulture.

D. P. ORMROD, B.S.A. (Brit. Col.), Ph.D. (Calif.), Associate Professor.

A. J. RENNEY, B.S.A. (Brit. Col.), M.S. (Calif.), Ph.D. (Oregon State), Associate Professor of Agronomy.

G. W. EATON, B.S.A. (Toronto), Ph.D. (Ohio State), Assistant Professor of Horticulture.

NEIL A. MACLEAN, B.S., Ph.D. (Washington State), Assistant Professor.

H. ANDISON, B.S.A. (Brit. Col.), Honorary Lecturer.

M. F. CLARKE, M.S.A. (Brit. Col.), Ph.D. (Penn.), Honorary Lecturer.

R. E. FITZPATRICK, B.S.A. (McGill), Ph.D. (Toronto), Honorary Lecturer.

R. H. HANDFORD, B.S.A. (Man.), M.S.A. (Sask.), Ph.D. (Minn.), Honorary Lecturer.

H. R. MACCARTHY, B.A. (Brit. Col.), Ph.D. (Calif.), Honorary Lecturer.

C. C. STRACHAN, B.S.A. (Brit. Col.), Ph.D. (Mass.), Honorary Lecturer.

Department of Poultry Science

JACOB BIELY, M.S.A. (Brit. Col.), M.S. (Kansas State), F.A.I.C., F.P.S.A.,
Professor and Chairman of the Department.

MRS. BERYL E. MARCH, B.A., M.S.A. (Brit. Col.), Associate Professor.

C. W. ROBERTS, B.S. (Oklahoma), M.S., Ph.D. (Minn.), Assistant Professor.

J. F. RICHARDS, M.Sc. (Man.), Ph.D. (Minn.), Assistant Professor.

H. W. ELLIS, B.S.A. (Brit. Col.), Special Assistant.

J. C. BANKIER, B.V.Sc. (Toronto), Honorary Lecturer.

H. L. A. TARR, M.S.A. (Brit. Col.), Ph.D. (McGill and Cantab.), Honorary
Lecturer.

Department of Soil Science

C. A. ROWLES, M.Sc. (Sask.), Ph.D. (Minnesota), Professor and Chairman
of the Department.

E. H. GARDNER, D.F.C., B.S.A. (Brit. Col.), M.S., Ph.D. (Oregon State),
Associate Professor.

L. H. WULLSTEIN, B.S. (Utah), M.S., Ph.D. (Oregon State), Assistant Pro-
fessor.

J. DEVRIES, B.Sc. (Alberta), M.S.A. (Toronto), Instructor.

L. FARSTAD, B.S.A. (Sask.), M.S.A. (Brit. Col.), Honorary Lecturer.

FACULTY OF AGRICULTURE

The Faculty of Agriculture offers courses leading to:

1. Bachelor of Science in Agriculture (B.S.A.)*, General Course.
2. Bachelor of Science in Agriculture (B.S.A.)*, Honours Course.
3. Master of Science in Agriculture (M.S.A.)*, Faculty of Graduate Studies.
4. Master of Science (M.Sc.), Faculty of Graduate Studies.
5. Doctor of Philosophy (Ph.D.), Faculty of Graduate Studies.
6. Diploma in Agriculture (Occupational Course).

The Faculty of Agriculture offers a wide selection of courses emphasizing the basic and agricultural sciences, with the object of developing an understanding of the applications of scientific principles to agriculture in students whose aptitudes and interests lie in the natural and social sciences and whose vocational objectives are directed towards scientific research, business and industry, secondary school teaching, or public and private service.

The work of the Faculty is concerned with primary agriculture as exemplified by an understanding of soil, by the growing, protecting, harvesting and marketing of crops and by the care, nutrition and management of animals. As it is also concerned with the processing and marketing of agricultural products, it trains students for industries such as dairying, meat-packing, fruit and vegetable processing, brewing and wine-making. Another facet of the work of the Faculty is the opportunity afforded students to specialize in basic sciences such as genetics, physiology, nutrition, and pathology, with application directed towards plants and animals, or in bio-chemistry and microbiology with emphasis on animals, plants and foods. Work is given in pedology and in the application of microbiology, chemistry, physics and mineralogy to soils. Complementary courses in agricultural economics relating to production, prices, marketing and public policy in agriculture are available to those whose challenge lies in the field of economics or rural sociology. A general course in agricultural engineering provides for specialization in agricultural mechanization.

In addition to well-equipped laboratories for research and teaching in various aspects of the basic agricultural sciences, and of the application of engineering and economics to agriculture, the Faculty also has available greenhouses and land as ancillary facilities for undergraduate and graduate studies in agronomy, horticulture, floriculture and plant protection; and supplementary resources for teaching and research with beef and dairy cattle, swine, sheep, fur-bearing animals and poultry.

General and Honours Courses

In the General Course the Faculty offers a four-year programme of study designed to prepare graduates to enter a wide variety of careers associated with agriculture in business, education, extension, farming, management, marketing, quality control and research in either private enterprise or the public service. The first two years of work are devoted largely to acquiring

* The colour of the hood is maize, the Bachelor's hood trimmed with the colour and the Master's lined.

a knowledge of the basic sciences and to laying a foundation for the work of the following years. During the last two years a student may select, in consultation with the Dean, a generalized course or a course which emphasizes one phase of agriculture.

In the Honours Course the Faculty offers a five-year programme of study to students who are primarily interested in and capable of a career in various specialized fields of study associated with agriculture. The first three years are devoted mainly to laying a foundation in the sciences and the humanities. The student is also brought into early association with the fundamental agricultural sciences and techniques. In this way the student has the opportunity of obtaining the proper background for specialization in the final two years.

Work in the four-year General Course and the five-year Honours Course in the Faculty of Agriculture is offered in the following fields of study:

Agricultural Economics	Dairy Science
Agricultural Economics and Commerce	Agricultural Entomology
Agricultural Mechanics	Food Science and Technology
Agriculture and Teaching	Plant Science: Agronomy
Agriculture and Wildlife Management	Horticulture, Genetics, Nutrition and Plant Protection
Animal Science: Genetics, Nutrition, and Physiology	Poultry Science: Nutrition, Physiology, Genetics and Processing
	Soil Science

Master's and Doctor of Philosophy Courses

See Faculty of Graduate Studies calendar.

Veterinary Medicine

A two-year pre-veterinary course leading to admission to the four-year course in Veterinary Medicine offered by the Colleges of Veterinary Medicine at the University of Guelph or at the University of Saskatchewan may be pursued in the Faculty of Agriculture. The course requires two full years work at the University. The specific requirements in the case of each student will be determined after consultation with the Dean of Agriculture.

The Occupational Course

Young men and women who are interested in a career in agriculture, who may not wish to proceed towards a degree and who may not have completed high school, may enroll in a course leading to a Diploma in Agriculture.

A wide choice is open to the student who wishes to enter the Occupational Course. In consultation with the Dean and heads of departments he may elect courses to meet his individual requirements from among the following subject fields:

Agricultural Economics	Agronomy
Agricultural Mechanics	Horticulture
Animal Husbandry	Poultry Science
Dairying	Soil Science

The course is offered during the regular winter session. If at the end of his course the student elects to proceed further in Agriculture, credit toward a degree will be granted for those subjects in which satisfactory

grades have been obtained, provided High School Graduation (University Programme) requirements have been met.

The Diploma is awarded to candidates who obtain passing marks in at least 15 units of course work.

In order to obtain maximum benefit from the course, students should have completed at least Grade 10 and be 18 years of age.

Those interested should write to the Dean of Agriculture, The University of British Columbia.

Regulations regarding Board and Residence are given in the General Information bulletin.

Short Courses

Short Courses are available for men and women who are unable to take advantage of the longer courses, but who desire to extend their knowledge of agriculture in one or more of those branches in which they are particularly interested.

Special announcements giving details of the various courses are issued each year, and may be obtained from the Director of University Extension on application.

Professional Association

In order to practise as a Professional Agrologist in the Province of British Columbia it is necessary to be registered as a member in the British Columbia Institute of Agrologists. A student who plans to become an agrologist may enroll with the Institute as an undergraduate. Applications should be forwarded to the Registrar, B. C. Institute of Agrologists, 16580 Hjorth Rd., N. Surrey, B. C.

COURSES LEADING TO THE DEGREE OF B.S.A.

Secondary School Graduation (University Programme) or its equivalent, is required for admission to all courses leading to the degree of B.S.A.

Four-Year General Course Curriculum

Candidates for the B.S.A. degree in the four-year general course must complete 68 units of work as required below; 31 of these units normally are taken in the first two years. The particular programme of courses taken by a student in any year must be prepared in consultation with a member of Faculty and is subject to approval by the head(s) of the department(s) or division(s) concerned, the Dean and the Committee on Courses. No more than 19 units of study may be taken by a student in any one year without approval of Faculty.

A student's standing at graduation will be determined by averaging the marks obtained in the best 37 units of required work of the third and fourth year.

Five-Year Honours Course Curriculum

Candidates for the B.S.A. degree in the five-year honours course must complete 89 units of work as required below; 34 of these units normally are taken in the first two years. Students who propose to take the honours course must obtain the consent of the department(s) or division(s) con-

cerned and of the Dean before entering the third year. Consent normally will be granted only to those students who have taken the prerequisite courses for the particular field of study and have a clear academic record at the end of their second year, with at least Second Class standing in the courses of the first two years. To remain in the honours course, a student must obtain at least Second Class standing in each of the last three years in all courses as required by the head(s) of the department(s) or division(s) concerned.

The particular programme of courses taken by a student in any year must be prepared in consultation with a member of Faculty and is subject to approval by the head(s) of the department(s) or division(s) concerned, the Dean and the Committee on Courses. No more than 19 units of study may be taken by a student in any one year without approval of Faculty.

Honours are of two grades: First Class and Second Class. A student's standing at graduation will be determined by averaging the marks obtained in the best 37 units of required work in the fourth and fifth years. A student who fails to obtain Second Class standing at graduation may be granted Pass standing.

Requirements for the B.S.A. Degree

Subject	4-Year General Course Units	5-Year Honours Course Units
English 100	3	3
Chemistry 101 or 102 or 110	3 and 200 or 205	6
Mathematics 110 or 120 (note 1)	3	3
Biology 101 or Zoology 105, Physics 101 or 110	6	6
Non-science electives	5-6	5-6
Biology, Botany, Chemistry, Economics, Geology, Mathematics, Microbiology, Physics, Statistics, Zoology (note 3)	9	12
Agriculture 100	1	1
Agriculture 300 (note 4)	1	1
Additional courses in Agriculture outside the department in which the graduat- ing essay is written (note 2)	10½	10½
Graduating essay (note 5)	3	3
Departmental requirements and electives (note 6)	23½-22½	38½-37½
Total	68	89

Notes

1. Mathematics 120 is prerequisite to Mathematics 202 and other courses in mathematics except Mathematics 201 and 205.

2. Students may substitute not more than 3 units of courses in other faculties for courses in Agriculture outside their major department and/or in the non/science electives.
3. These units must include a minimum of $1\frac{1}{2}$ units of economics (Agricultural Economics 200 or equivalent) and $1\frac{1}{2}$ units of statistics (Plant Science 321 or equivalent). The five-year honours course requires Economics 200 and Physics 110 or 101 as well as the $1\frac{1}{2}$ units of statistics.
4. Normally this course is taken during the week prior to registration in the third year.
5. In the graduating year, each student shall prepare an essay on some topic, the subject of which shall be approved by the head(s) of the department(s) or division(s) concerned. Two typewritten copies of each essay shall be submitted on the last day of lectures.
6. Not more than 18 units (including the graduating essay) may be taken in the department in which the graduating essay is being written.

Fees—*Subject to change without notice*

First Term Fees, \$249 B.S.A.; \$194 Occupational, (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$469 B.S.A.; \$359 Occupational, at time of registration. Fourth Year students are assessed an additional \$7 to cover the graduating fee.

Second Term Fees, \$220 B.S.A.; \$165 Occupational, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Students transferring credit from the Occupational Course must pay the difference in fees at the time of transfer.

Partial Course: Consult the General Information bulletin.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments, may, on the recommendation of the Head of the Department, be excluded by the Dean of the Faculty from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees. (See the General Information bulletin.)

The Senate of the University may require a student to withdraw from the

University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

EXAMINATIONS AND ADVANCEMENT

1. Examinations in all subjects, obligatory for all students, are held in April. In the case of subjects which are final at Christmas and in the case of courses of the First and Second Years, examinations will be held in December as well. Applications for special consideration on account of illness or domestic affliction must be submitted to the Dean not later than 48 hours after the close of the examination period.

2. In any course which involves both laboratory work and written examinations, students will be required to make satisfactory standing in both parts. Results in laboratory work will be announced prior to the final examination, and students who have not obtained a mark of at least 50% will neither be permitted to write the examination nor to receive any credit for the course. If the course is repeated no exemption will be granted from the work in either part.

3. Successful candidates will be graded as follows: First Class, an average of 80% or over; Second Class, 65 to 80%; Pass, 50 to 65%.

4. (a) A student taking 9 or more units in the winter session will receive credit for a course only if, as a result of the final examinations of that session, he passes in courses totalling at least 9 units, including the course in question. The passing grade for a course is 50%.

(b) A student taking fewer than 9 units in the winter session will receive credit for a course only if, as a result of the final examinations of that session, he passes in all his courses. The passing grade for a course is 50%.

(c) A student in the summer session will receive credit for each course in which he obtains a grade of at least 50%.

5. Courses for which credit has not been obtained must be repeated, or permissible substitutes taken, in the next regular session attended. In the winter session the total of all courses taken may not exceed 19 units except with approval of the Faculty.

6. (a) In the winter session, if a student's general standing in the final examination of any year is sufficiently high, the Faculty may grant him supplemental examinations in the subject or subjects in which he has failed provided (i) he has written the final examination in the subject and has obtained a final mark of not less than 40% and (ii) he has obtained at least 9 units of credit in the session.

(b) In the summer session, a candidate will be granted a supplemental in a subject which he has taken during that session provided (i) he has written the final examination and has obtained a final mark of not less than 40%, and (ii) he has obtained 3 units of credit in that session.

7. Special examinations will not be granted, except by special permission of the Faculty, and on payment of a fee of \$20.00 for each paper. Application for special examinations must be made at least two weeks prior to the scheduled meetings of the Faculty in October and February.

8. If a supplemental granted in a course is passed with a grade of at least 50%, credit will be given for the course.

9. In all but the Final Year a candidate who has been granted a supplemental may write it only once. If he fails, he must repeat the course or take a permissible substitute. In the Final Year he may write it twice.

10. Supplemental examinations, covering the work of both the first and second terms, will be held in August in respect of winter session examinations, and in December in respect of summer session examinations.

11. Term essays and examination papers will be refused a passing mark if they are noticeably deficient in English; and, in this event, students will be required to pass a special examination in English to be set by the Department of English.

12. A student with standing defective in respect of more than 3 units, although he will not be permitted to register in a higher year, may be allowed to continue by registering in the lower year and by taking courses in accordance with Paragraph 5 above.

13. A student who passes in fewer than six units (two courses) in the first year of University following Grade 12 will not be permitted to re-enrol at University to repeat the studies of that year. Consideration will be given to re-admitting a student in this category following his satisfactory completion of Grade 13 or its equivalent. A student who passes six units, while not receiving credit in the year, may re-enrol on probation to repeat his studies but during the subsequent session may be required to withdraw at any time for unsatisfactory progress.

14. A student in the First Year who obtains credit for only nine units on a full programme will be re-admitted on probation but during the subsequent session may be required at any time to withdraw for unsatisfactory progress.

15. A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to withdraw from the University; he may be re-admitted after a period of at least one year if his appeal to Senate is supported by the Committee on Admissions of the Faculty concerned and upheld by Senate.

16. Any student whose academic record, as determined by the tests and examinations of the first term of the First or Second Year, is found to be unsatisfactory, may be required to discontinue attendance at the University for the remainder of the Session. A student who fails the First Year may be denied readmission and be reconsidered for admission only on the basis of full Grade 13 standing or the equivalent.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the deadline.

Re-reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be

granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplemental Examinations

Supplemental examinations may be written in August at the following centres: Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances, a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.00.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken.*" On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

TEACHER TRAINING COURSE

As well as satisfying the requirements of their own departments in the Faculty, students planning to enter the one-year Teacher Training Course for Graduates through Agriculture must have Biology 101 or Zoology 105, Chemistry 101 or 102 or 110, Mathematics 110 or 120, Physics 110 or 101 or 103 and in addition must have at least 9 units of credit in approved courses selected from one of the following: Biological Sciences, Chemistry, Mathematics or Physics. The particular courses should be selected according to the requirements of the Faculty of Education (Teaching Majors for Secondary Teachers). Geology 105—General Geology, is strongly recommended.

For further particulars see *Faculty of Education calendar*.

COURSES IN AGRICULTURE

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 100 (1) under Agriculture indicates that Agriculture 100 is a one-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms.	[2-3; 2-3]
1 lecture and 2 hours laboratory per week, first term.	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term.	[0-0; 1-2]
2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms.	[2-3-2; 2-3-2]

Agriculture

100. (1) *History of Scientific Agriculture*.—An orientation course embracing a study of the history and development of modern scientific agriculture; the contributions of the sciences to this development, and the nature, problems, and relationship of the various branches of agriculture. [2-0; 2-0]

300. (1) *Field Trip*.—Observing, recording and correlating agricultural facts in the field. One week of work is required of all students in Agriculture prior to Third Year entry. Staff and other members of the B.C. Institute of Agrologists. The cost to each student will be approximately \$25.

401. (1½) **Extension Methods.**—An introduction to practices and policies of agricultural extension. Aspects of adult learning, community organization, mass communications, and major agencies of extension will be considered. [0-0; 2-2]

423. (3) **Food Science Seminar.**—Presentation, discussion, criticism of scientific and technical papers.

425. (3) **Food Science Undergraduate Essay.**—On a prescribed study.

Courses for Graduate Students

500. (1-3) **Food Science Graduate Seminar.**

530. (1-3) **Food Science Directed Studies.**

549. (5-6) **Food Science Master's Thesis.**

Agricultural Economics

200. (1½) **Introduction to Agricultural Economics.**—Economic principles determining production, price and income applied to agricultural production, marketing and public policy. Textbook: Bishop & Toussaint, *Introduction to Agricultural Economics Analysis*. [3-2; 0-0]

Agricultural Economics 200 or Economics 200 is a prerequisite to other courses except Agricultural Economics 403.

300. (1½) **Farm Organization and Management.**—Farm records and accounts. Economic principles used in resource use and enterprise combination decisions. Planning procedures. Management problems connected with specific enterprises and resources, financing, farm valuation, getting started in farming and obtaining information. Farm management research methods. Textbooks: Hopkins and Heady, *Farm Accounting*; Heady and Jensen, *Farm Management Economics*. [0-0; 2-2]

401. (3) **Marketing.**—The evolution and structure of the marketing system, the price-making process in various markets; causes and effects of price fluctuations; marketing legislation; cooperative marketing; efficiency in marketing. Textbook: Shepherd, G. S., *Marketing Farm Products—Economic Analysis*. [3-0; 3-0]

402. (3) **Production Functions and Linear Programming.**—Theory and empirical derivation of production functions; introduction to the theory and techniques of linear programming; applications to problems of profit maximization and cost minimization in agricultural production and in marketing. Textbooks: E. O. Heady, *Economics of Agricultural Production and Resource Use*; Heady & Candler, *Linear Programming*. References; journal articles and research bulletins. [3-0; 3-0]

403. (3) **The Organization of Rural Society.**—Characteristics of people, groups and organizations; dimensions of the rural community and nature and direction of community development. Textbooks: Nelson, Ramsey and Verner, *Community Structure and Change*. Prerequisite: Sociology 200 or consent of instructor. [3-0; 3-0]

405. (1½) **Seminar.**—Application of economic analysis to contemporary problems in agricultural economics. [0-0; 3-0]

425. (3) **Undergraduate Essay.**

430. (1-3) **Directed Studies.**—On an approved problem.

Other Courses Which Qualify for Agricultural Economics Credit:

Economics 300, 302, 304, 307, 309.

Geography 201, 304.

Courses for Graduate Students

500. (1-3) Graduate Seminar.

501. (3) **Advanced Marketing.**—Price-making forces at retail, wholesale and farm market level. Critical analysis of various marketing schemes. Prerequisite: adequate background in economics.

502. (3) **Agricultural Problems and Policy.**—Influential doctrines in agricultural policy; problems of economic efficiency and welfare. Critical review of present and proposed price and income policies. Prerequisite: adequate background in economics.

504. (3) **Extension Planning and Evaluation.**—A study of the relative effectiveness of various methods for the diffusion of agricultural information.

530. (1-3) **Directed Studies.**—On an approved problem.

549. (5-6) **Master's Thesis.**

Agricultural Mechanics

300. (1½) **Power Systems in Agriculture and Food Processing.**—Work and energy, thermal, electric and hydraulic power sources. Prerequisite: Physics 110 or 101. [2-2; 0-0]

301. (1½) **Thermal Systems in Agriculture and Food Processing.**—Liquid-vapour phase relationships, heat transfer, psychrometry, drying and refrigeration. Prerequisite: Agricultural Mechanics 300. [0-0; 2-2]

303. (1½) **Machine Systems in Production Agriculture.**—System selection, machine-power, unit-soil relationships, physico-mechanical principles of seeding, fertilization, spraying and harvesting. Prerequisite: Agricultural Mechanics 300. [0-0; 2-2]

304. (1½) **Drainage.**—Introduction to hydrology, rainfall and run-off relationships. Textbook: Schwab et al, *Elementary Soil & Water Engineering*. [2-2; 0-0]

305. (1½) **Irrigation.**—Sources of water, soil and water relationships, application methods, and efficient use. Textbook: Israelsen, *Irrigation Principles and Practices*. [0-0; 2-2]

401. (3) **Food Mechanics.**—Thermodynamics, evaporation, chemical and mechanical separations, mixing, instrumentation, canning and freezing, electromagnetic radiations. Prerequisites: Agricultural Mechanics 301 and Mathematics 202. [2-3; 2-3]

403. (1½) **Internal Combustion Engines.**—The theory of internal combustion engines. Fundamentals of thermodynamics. Prerequisite: Agricultural Mechanics 303. Offered in 1966-67 and alternate years. [0-0; 2-2]

404. (3) **Farm Buildings.**—Farmstead planning, selection of building materials, environmental control, design requirements. Prerequisite: Physics 110 or 101. Offered in 1966-67 and alternate years. [2-2; 2-2]

408. (1½) **Seminar.**—Lectures, discussions of scientific papers.

425. (3) **Undergraduate essay.**

430. (1-3) **Directed Studies.**

Courses for Graduate Students

500. (1-3) Graduate Seminar.

501. (3) **Advanced Food Mechanics.**—Problems in the selection and operation of food-processing machinery. Problems in specific industries may be

attempted by individual students where feasible. Prerequisite: Agricultural Mechanics 401.

530. (3) **Directed Studies.**—On an approved problem (farm power and machinery, farm structures, irrigation and drainage, processing).

549. (5-6) **Master's Thesis.**

Agronomy

For courses see Plant Science.

Animal Husbandry

For courses see Animal Science.

Animal Science

(a) Courses in Animal Husbandry

200. (1½) **General Animal Husbandry.**—Origin, development, characteristics, adaptations and judging of breeds of livestock; principles of breeding, selection, feeding, management, marketing; disease problems. Textbook: Cole, *Introduction to Livestock Production*. [3-2; 0-0]

313. (1½) **The Genetics of Animal Breeding.**—The application of genetics to animal improvement; the genetics of specific characteristics and of hereditary defects; genetic variability, its significance and control. Textbook: Winters, *Introduction to Animal Breeding*. [2-2; 0-0]

318. (3) **Livestock Production, Management and Marketing.**—Comprehensive course dealing with the interrelated problems associated with improving the efficiency in producing and marketing livestock. Emphasis will be placed on the maintenance of animal health. [2-2; 2-2]

320. (3) **Animal Physiology.**—A study of the anatomy and physiology of farm animals; physiological implications concerned with animal growth, reproduction and lactation. Textbook: Dukes, *The Physiology of Domestic Animals*. Prerequisite: Recommended concurrently: Chemistry 230. [2-2; 2-2]

322. (3) **Fundamentals of Animal Nutrition.**—Nutritional aspects associated with animal development and performance. Textbook: Maynard and Loosli, *Animal Nutrition* (1962). Prerequisite: Recommended concurrently: Chemistry 230. [2-3; 2-3]

406. (1½) **Technology of Animal Products.**—The chemical, physical, and microbiological changes arising in the course of the processing of animals and animal by-products. Prerequisites: Chemistry 230, Microbiology 200. [0-0; 2-2]

413. (3) **Genetics and Animal Performance.**—Standards of excellence, selection and mating systems; herd and pedigree studies; genetic aspects and consequences of performance testing and of other animal improvement policies. Textbook: Winters, *Introduction to Animal Breeding*, and Winters, *Animal Breeding*. [2-2; 2-2]

419. (1) **Seminar.**—Research and experimental problems; preparation of reports and bulletins; current problems of animal industry.

420. (1½) **Physiology of Reproduction.**—Physiological mechanisms related to reproduction, breeding efficiency, fertility and milk secretion. Recommended concurrently: Chemistry 230. [0-0; 2-2]

422. (1½) **Animal Feeding.**—The economic and nutritional problems involved in feeding all types of livestock. Textbook: Morrison, *Feeds and Feeding*, 21st edition. [3-0; 0-0]

425. (3) Undergraduate Essay.

430. (1-3) Directed Studies.—On an approved problem.

Courses for Graduate Students

500. (1-3) Graduate Seminar.

513. (3) Advanced Animal Breeding.—Special phases and recent research findings. Lectures, seminars and research.

520. (3) Advanced Animal Physiology.—Rumen metabolism, reproduction and milk secretion in domestic animals.

522. (3) Advanced Animal Nutrition.—Special phases of animal nutrition. Nutritional deficiency state, bioenergetics, and growth.

530. (1-3) Directed Studies.—On an approved problem.

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

(b) Courses in Dairying

200. (1½) Introduction to Dairying.—A study of the production, processing, testing and grading of milk and related products and an introduction to the associated bacteriology and chemical techniques. [0-0; 3-2]

301. (3) Dairy Technology.—Principles and practices in manufacture of butter, cheese, ice cream, concentrated milk products. Prerequisites: Dairying 200. [1-6; 1-6]

406. (1½) Analytical Methods.—Standard methods for the chemical and physical analyses of products and materials important in the food industry. Prerequisite: Chemistry 205. [1-4; 0-0]

413. (1½) Mycology.—Physiology and metabolism of yeasts and molds. Laboratory work will be concerned with non-pathogenic organisms. Prerequisite: Microbiology 200, and Biochemistry 410, which may be taken concurrently. [2-2; 0-0]

423. (3) Undergraduate Seminar.—Presentation, discussion, criticism of scientific and technical papers.

425. (3) Undergraduate Essay.—On a prescribed laboratory study. Fourth Year.

430. (1-3) Directed Studies.—On an approved problem.

Courses for Graduate Students

500. (3) Graduate Seminar.

530. (3) Directed Studies.—On approved problems.

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

Dairying

For courses see Animal Science.

Food Science and Technology

The student's programme of courses in Food Science and Technology is under the direction of a Faculty Committee consisting of Dr. Ormrod, Dr. Richards and Professor Watson (Chairman). The undergraduate essay (Agriculture 425) may be written in any one of the Departments.

Horticulture

For courses see Plant Science.

Plant Science

(a) Courses in Agronomy

200. (1½) **Introduction to Field Crops.**—Study of important grain, forage and root crops, noxious weed seeds, commercial and seed grades of Canada, identification of principal types and varieties of field crops. Special problems of production, weed control and harvesting. [0-0; 3-2]

304. (1½) **Range Management.**—Ecology and management of rangeland. Textbook: Sampson, *Range Management*. [2-2; 0-0]

305. (1½) **Forage Management and Conservation.**—Grasses and legumes for pasture and forage, their management and conservation. Textbook: Hughes, Heath and Metcalf, *Forages*. [0-0; 2-2]

405. (1½) **Field Crops for Food and Fibre.**—Plant characteristics and cultural practices contributing to optimum production of selected field crops. Prerequisite: Agronomy 200. [2-2; 0-0]

(b) Courses in Horticulture

200. (1½) **General Horticulture.**—Horticultural enterprises, both commercial and home. An introduction to important tree fruits, small fruits, vegetables, landscape materials. Description, identification, classification, displaying and judging of the various crops. [0-0; 3-2]

301. (3) **Small Fruits and Tree Fruits.**—The science and practice of small fruit and tree fruit growing and handling; grapes, bramble fruits, currants, gooseberries, blueberries, cranberries, apples, pears, quinces, peaches, nectarines, cherries, plums, apricots, citrus fruits, nuts. Texts: Shoemaker, *Small Fruit Culture*, Shoemaker and Tesky, *Tree Fruit Production*. [2-2; 2-2]

316. (1½) **Landscape Horticulture.**—Culture and identification of plant materials. Elementary principles of landscape composition. [2-2; 0-0]

317. (3) **Vegetable Crops.**—Vegetable growing; sites, soils; planting, fertilizing, irrigating, cultivating; vegetable varieties; vegetable forcing. [2-2; 2-2]

416. (1½) **Landscape Construction and Design.**—Principles of landscape design. Garden construction. Visits to landscaped sites. Landscape problems. Prerequisite: Horticulture 316. (Offered in 1966-67 and alternate years.) [2-2; 0-0]

418. (1½) **Floriculture.**—A study of controlled environmental factors in the greenhouse with application to commercial flower crops. [0-0; 2-2]

Courses for Graduate Students

501. (3) **Advanced Pomology.**—Discussion of current research problems, systematic pomology, developmental and reproductive physiology, determination of nutrient requirements of fruit crops, morphogenesis. Open to graduate students with a background in pomology and physiology. Text: Childers, *Modern Fruit Science*. (Offered in 1966-67 and alternate years.)

517. (3) **Advanced Vegetable Crops.**—The improvement and production of vegetable crops, with emphasis on research methods and current problems. (Offered in 1967-68 and alternate years.)

(c) Courses in Plant Protection

308. (1½) **Weed Control.**—Common noxious weeds of the province. Losses caused by weeds, weed characteristics; cultural and chemical methods of control. [0-0; 2-2]

309. (3) **Pathology of Crops.**—Common diseases of agricultural plants; control measures; laboratory and field techniques. [2-2; 2-2]

312. (1 or 1½) Pesticides.—Chemical properties and physiological effects of insecticides, fungicides, herbicides, rodenticides, acaricides, and nematocides. [2-0; 0-0; 2-2; 0-0]

409. (3) Plant Pathology Techniques and Control of Plant Diseases.—Phytopathological methods of disease identification, isolation, and inoculation; principles and practices of disease control; relation of environment to disease development and host-parasite interactions. Prerequisite: Plant Protection 309. [2-2; 2-2]

Courses for Graduate Students

508. (3) The Ecology and Physiology of Weed Control.—Effects of environmental factors and phytotoxic agents on unwanted plants. Permission of instructor.

509. (3-5) Advanced Plant Pathology.—Laboratory and field techniques and procedures. Experimental methods, culture methods, virus studies, miscellaneous experimental methods, interpretation of experimental results.

(d) Courses in Plant Science

300. (1½) Field Studies and Practices in Agronomy, Horticulture, or Plant Protection.—Four months of field work under the direction of an accredited plant scientist supported by a report relative to some phase of the field operation.

321. (1½) Biometrics.—Elementary principles of the analysis, presentation and interpretation of biological data. Textbook: Li, *Statistical Inference*, Vol. I. Prerequisite: First year Mathematics. [3-2; 0-0]

322. (1½) Design of Experiments.—Practical problems and discussion of experimental design and interpretation. Prerequisite: Plant Science 321 or equivalent. [0-0; 2-2]

344. (3) Physiology of Crops.—Plant metabolism, including enzymes, photosynthesis, respiration, growth regulation, plant-water relationships, translocation, mineral nutrition. Various aspects of plant growth including influence of environmental factors. Textbook: Meyer, Anderson and Bohning, *Introduction to Plant Physiology*. Prerequisite: Biology 101. [2-2; 2-2]

406. (3) Crop Processing.—Principles of processing and preservation of field crops, fruits and vegetables. [2-2; 2-2]

407. (3) Genetics and Breeding of Crops.—Genetics in relation to crop improvement and preparation of plant breeding programmes for improved agricultural plants. [2-2; 2-2]

423. (1) Undergraduate Seminar.

425. (3) Undergraduate Essay.

450. (1½) Agricultural Climatology.—The effect of microclimates on crop growth and development. [0-0; 2-2]

Courses for Graduate Students

500. (1-3) Graduate Seminar.

507. (3) Advanced Plant Genetics and Breeding.—The genetics of crop plants. Prerequisite: Plant Science 407 or equivalent.

512. (1-3) Responses of Plants to Controlled Environments.—Experimental modification of the plant environment and its effects on growth, development, and post-harvest characteristics. Lectures and laboratories. Prerequisites: Botany 306 or Plant Science 344.

530. (3) Directed Studies.

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

Poultry Science

200. (1½) General Poultry Science.—Principles and practices employed in poultry production. Textbook: Card, *Poultry Production*, 8th edition. [0-0; 3-2]

306. (1½) Poultry Products Processing.—Principles of processing, preservation, and quality evaluation of meat and eggs. [2-2; 0-0]

313. (3) Poultry Genetics I.—Genetic principles related to poultry. Prerequisite: Plant Science 321, or consent of instructor. [2-2; 2-2]

322. (1½) Fundamentals of Nutrition.—An introductory study of the essential nutrients and their functions in animal nutrition. Interrelationships among proteins, vitamins, enzymes and hormones. Textbook: Maynard and Loosli, *Animal Nutrition* (1962). Prerequisite: Chemistry 205. Recommended concurrently: Chemistry 230. [2-3; 0-0]

404. (1½) Poultry Management and Marketing.—Poultry industry structure; systems of management; relationship of biological and economic principles to the decision process. [2-2; 0-0]

406. (1½) Poultry Products Technology.—Properties of meat and eggs as related to the characteristics of natural and derived products. Poultry Science 306 recommended. [0-0; 2-2]

410. (1½) Poultry Nutrition.—Principles of poultry nutrition. Recent advances in the knowledge of the nutritive requirements of the domestic fowl. References: Ewing, *Poultry Nutrition*, latest edition. Prerequisite: Chemistry 230. [2-3; 0-0]

411. (1½) Poultry Feeds and Feeding.—Physiology of avian digestion. Review of nutritional requirements. Composition and classification of feed-stuffs. Formulation of rations for different classes of poultry. Feeding practices and management. Textbook: Heuser, *Feeding Poultry*. [0-0; 2-2]

413. (1½) Poultry Genetics II.—Fundamentals of population genetics. Text: Falconer, *Quantitative Genetics*. Prerequisites: Poultry Science 313 or equivalent, Plant Science 321 and 322 or equivalent. [2-2; 0-0]

414. (1½) Hygiene.—Hygienic measures for the prevention and control of disease. Prerequisite: Microbiology 200. [2-2; 0-0]

415. (1½) Poultry Diseases.—Anatomy and physiology of the fowl; common ailments of poultry and their treatment; autopsies; inspection of farms. Prerequisite: Microbiology 200. [0-0; 2-2]

420. (1½) Physiology of Reproduction.—Fundamentals of egg production and reproduction in the domestic fowl. Recent advances in endocrinology affecting poultry. [0-0; 2-2]

423. (1-3) Seminar.—Poultry literature; research and experimental problems; preparation of reports and bulletins. [1-2; 0-0]

425. (3) Undergraduate Essay.

430. (1-3) Directed Studies.—On an approved problem.

Courses for Graduate Students

500. (1-3) Graduate Seminar.

513. (1½) Poultry Genetics III.—Advanced population genetics and biometrical genetics. Textbook: Falconer, *Quantitative Genetics*, and selected research literature. Prerequisites: Poultry Science 413.

522. (3) Nutritional Bio-assay Techniques.—References: A.O.A.C. *Methods of Analysis*; Emmens, *Principles of Biological Assay*. To be taken only with consent of instructor.

523. (1½) Biometrical Techniques.—Advanced biometrical techniques in agricultural experimentation. Prerequisite: Poultry Science 322 or equivalent. (Given in 1968-69 and alternate years.)

530. (3) Directed Studies.—On an approved problem. (Breeding, nutrition, physiology and poultry products marketing and technology.)

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

Soil Science

Note: Soil Science 312 is open to students in Microbiology for credit in Faculty of Science.

200. (1½) An Introduction to the Study of Soils.—Physical, chemical and biological properties of soils; soil formation, classification, use and conservation. (Credit will not be given for both Soil Science 200 and 203.) [3-2; 0-0]

203. (2) General Forest Soils.—An introduction to the study of soil properties and soil-plant relationships with emphasis on forest soils. Credit will not be given for both Soil Science 200 and 203. [1-2; 2-2]

311. (1½) Soil Microbiology.—General metabolism, systematics and fundamental techniques used in the study of soil microorganisms. (Same as Microbiology 311.) Prerequisite: Microbiology 200. [1-4; 0-0]

312. (1½) Soil Microbiology.—Microbiological and biochemical processes of soil microorganisms in soils. Prerequisite: Soil Science 311. [0-0; 1-4]

313. (1½) Soil Physics.—The physical properties of soils and their measurement. Prerequisite: Physics 110 or 101. [2-2; 0-0]

314. (1½) Soil Conservation.—Conservation of soil resources in Agriculture and Forestry; run-off and erosion, conservation practices. Prerequisites: Soil Science 200 or 203. [2-2; 0-0]

315. (1½) Soil Fertility.—Principles underlying soil management practices including nutrient supply, fertilizers and soil amendments; experimental methods and soil analysis. Prerequisites: Soil Science 200 or 203 which may be taken concurrently, or permission of instructor. [0-0; 2-2]

404. (1½) Chemical Properties of Soils.—Nature and properties of soil colloids and the behaviour of ions in soils. Prerequisites: Chemistry 205 and permission of instructor. [2-2; 0-0]

406. (1½) Soil-Plant Relationships.—Physical, chemical and biological properties of soils in relation to plant growth. Prerequisite: adequate background in Botany, Chemistry, Plant Science and Soil Science and by permission of instructor. (Offered jointly by members of the Department.) [0-0; 2-2]

416. (1½) Soil Genesis, Classification and Cartography.—Factors of soil formation, field description, classification and cartography of soils; nature, distribution and use of soil groups. (Some field work is required.) Prerequisite: Soil Science 200 or 203. [0-0; 2-2]

417. (1½) **Soil Surveying.**—Two to three months of field work under direction of a soil surveyor, supported by an essay relative to some phase of the field operations. Prerequisite: Second Class standing in Soil Science 416.

423. (1) **Undergraduate Seminar.**

425. (3) **Undergraduate Essay.**

430. (1-3) **Directed Studies.**—Systematic work on approved problem.

Courses for Graduate Students

500. (2) **Graduate Seminar.**

504. (1½-3) **Advanced Soil Chemistry.**—A study of research findings in specific phases of Soil Chemistry.

512. (1½-3) **Advanced Soil Microbiology.**—Lectures and laboratories relating to modern methods, concepts and research in soil microbiology. Prerequisites: Chemistry 230 and Soil Science 312; or by permission of instructor. (Offered in the second term.)

513. (1½-3) **Advanced Soil Physics.**—A study of research findings in specific phases of Soil Physics.

530. (3) **Directed Studies.**

549. (5-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

COURSES GIVEN IN OTHER FACULTIES

Botany

101. (3) **Principles of Biology.**—An introductory course emphasizing principles of wide application to all living organisms, including cell structure and function, the mechanism of inheritance, evolution, and adaptation to environment. A comparative approach to the unity and diversity of organisms will be stressed. A one hour tutorial is required each week for those students who have not previously had Biology 11 or its equivalent in high school.

334. (2) **Fundamental Genetics.**—An introduction to the basic principles of heredity, with emphasis on the physical and chemical structure and function of genetic material. Prerequisite: One of: Biology 101, 105, or Zoology 105. [3-2; 0-0]

Chemistry

101. (3) **General Chemistry.**—Fundamental theories, periodic table, descriptive inorganic chemistry, chemical calculations, modern valency concepts, elementary nuclear chemistry. Mathematics 110 or 120 must precede or be taken concurrently. [3-3; 3-3]

102. (3) **General Chemistry.**—Similar to Chemistry 101 but in somewhat more detail. This course is intended only for prospective Honours science and engineering students. Prerequisites: Mathematics 120 and Physics 110 or 101 which must precede or be taken concurrently. [3-3; 3-3]

110. (3) **Principles of Chemistry.**—A study of the fundamental principles of Chemistry with particular reference to the nature of solutions, the solid state and the molecular structure of both inorganic and organic substances. This course is intended for prospective Science and Engineering students who have not taken Chemistry 12. Prerequisites: Chemistry 11, Physics 11, Mathematics 120 and a first year Physics course must precede or be taken concurrently. [3-3-1; 3-3-1]

205. (3) **Physical-Inorganic and Analytical Chemistry.**—Systematic inorganic chemistry, properties of matter from a molecular standpoint, equilibria in solution, physical chemistry useful in biological, medical, agricultural, and related sciences. This course is not intended for Honours (or majors) students in the physical sciences. Prerequisites: Chemistry 110 or 101 or 102, and Mathematics 110 or 120. [3-4; 3-4]

230. (3) **Organic Chemistry.**—The fundamental principles of modern organic chemistry including a discussion of the main classes of organic compounds. Prerequisite: Chemistry 110 or 102 or 101. [3-3; 3-3]

Economics

200. (3) **Principles of Economics.**—The institutions and processes involved in the production and distribution of wealth; basic determinants of prices and costs, the determinants of income and employment; international trade. Prerequisites: First Year standing. [3-0; 3-0]

307. (3) **Agricultural and Land Economics.**—Production, prices and income distribution in agriculture. The problem of optimum use of resources with particular reference to agricultural and urban land use; includes considerations of land compensation, acquisition, tenure, financing; also the effect of uncertainty, technological progress, urbanization and population growth. [3-0; 3-0]

English

100. (3) **Literature and Composition.**—A study of literature in the nineteenth and twentieth centuries, and of the principles of composition. Themes and exercises are required. [4-0; 4-0]

Geology

105. (3) **General Geology.**—Physical and historical geology. Origin and structure of the earth, materials of the earth, diastrophism, erosion, land forms, mineral deposits, history of the earth and the development of life. Prerequisite: one of Chemistry 110 or 101 or 102, Physics 110 or 101, Biology 101, before or concurrently. [2-2; 2-2]

Mathematics

110. (3) **Fundamental Mathematics.**—Sets, algebra, introduction to probability and statistical inference, introduction to calculus. This course is recommended for students in commerce, the humanities and the social sciences, and will not be accepted as a prerequisite to Mathematics 155, 202, 220. [3-1; 3-1]

120. (3) **Fundamental Mathematics.**—Trigonometry, analytic geometry and calculus. This course is prerequisite to Mathematics 155, 156, 200, 202, 220, 221, 240. It is a required course for all students in the Faculty of Science and for all students intending to take engineering, architecture or a major or an honours course in mathematics. [3-1; 3-1]

202. (3) **Calculus.**—Differential and integral calculus, with applications. Prerequisite: Mathematics 120. [3-0; 3-0]

Microbiology

200. (3) **Introductory Microbiology.**—History of bacteriology; bacteria in nature; classification of bacterial forms; methods of culture and isolation; relation of bacteria to agriculture, industry, veterinary science, public health

and sanitation. Prerequisite: Chemistry 110 or 101 or 102, which may be taken concurrently. This course is prerequisite to all other courses in the Department. [2-3; 2-3]

Physics

101. (3) **Elementary Physics.**—Prerequisite: Mathematics 110 or 120 must precede or be taken concurrently with this course. Students who have not obtained credit for Physics 91 in the schools must take an additional hour per week. [2-3-1; 2-3-1]


110. (3) **Mechanics, Electricity and Atomic Structure.**—Prerequisite: Physics 11. Mathematics 120 must precede or be taken concurrently with this course. Textbook: To be announced. [3-3*-2*; 3-3*-2*]

Zoology

311. (1½) **Introduction to Entomology.**—A survey of the structure, classification and biology of insects, with an introduction to spiders, mites and ticks. For students not specializing in Entomology. Students will get credit for only one of Zoology 311 and 410. [2-3; 0-0]

Note: The following additional courses from departments in other Faculties will be required in certain options: Biochemistry 410; Botany 330; Chemistry 304, 305, 409, 410; Geography 201; Microbiology 304, 305; Zoology 202, 311.

Other courses may be required or elected from the above or other departments outside the Faculty of Agriculture. The calendar of the Faculty offering the specific course or courses should be consulted for detailed descriptions.



**THE FACULTY
OF
APPLIED SCIENCE
ENGINEERING**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Applied Science calendar, 1966-67

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Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

FACULTY OF APPLIED SCIENCE

W. M. ARMSTRONG, B.A.Sc. (Toronto), P.Eng., M.C.I.M., Professor and Dean of the Faculty.

Department of Agricultural Engineering

T. L. COULTHARD, B.E. (Sask.), M.Sc. (Calif.), P.Eng., Professor and Chairman of the Department.

L. M. STALEY, B.A.Sc. (Brit. Col.), M.Sc. (Calif.), P.Eng., Associate Professor.

E. L. WATSON, B.A.Sc. (Brit. Col.), M.Sc. (Calif.), P.Eng., Associate Professor.

Department of Chemical Engineering

J. S. FORSYTH, B.Sc. (Glasgow), Ph.D. (Leeds), A.R.I.C., M.I.Ch.E., F.C.I.C., Professor and Head of the Department.

S. D. CAVERS, M.A.Sc. (Brit. Col.), Ph.D. (Calif. Inst. Tech.), P.Eng., F.C.I.C., Professor.

N. EPSTEIN, M.Eng. (McGill), Eng. Sc.D. (New York Univ.), F.C.I.C., M.A.I.Ch.E., Professor.

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R. M. R. BRANION, B.A.Sc., M.A.Sc. (Toronto), Ph.D. (Sask.), Assistant Professor.

J. LIELMEZS, B.Sc. (Denver), M.Sc. (Northwestern), Assistant Professor.

D. A. RATKOWSKY, B.Ch.E. (C.C.N.Y.), Ph.D. (Washington), Assoc. M.A.I. Ch.E., Assistant Professor.

Honorary Lecturers in Pulp and Paper Technology

EDWARD BEKKYTO, B.Sc. (Queen's), M.Eng. (Yale), P.Eng. (Que.), M. TAPPI, M.Tech. Sect. C.P.P.A.

ALLAN W. DOWSLEY, B.A. (Brit. Col.), M. TAPPI, M. Tech. Sect. C.P.P.A.

ERIC T. GUEST, B.Sc. (Acadia), M. TAPPI, M. Tech. Sect. C.P.P.A.

GEORGE W. LEGG, B. Ch.E. (London), M. TAPPI, M. Tech. Sect. C.P.P.A.

WALLACE B. MACKEY, Dipl. Chem. Eng. (New South Wales), A.M. Inst. Ch.E., M. Tech. Sect. C.P.P.A.

JASPER MARDON, M.A. (Cantab.), F.R.I.C., A.M. Inst. Ch.E., M. Inst. Fuels, C.G.I.A., M. Tech. Sect. C.P.P.A., M. TAPPI.

ROMANO G. MERET, Ind. Chem. (Padua), M. TAPPI, M. Tech. Sect. C.P.P.A.

DONALD R. MUIR, B.A., M.A., Ph.D. (Toronto), M.C.I.C., M.A.C.S., M. TAPPI, M. Tech. Sect. C.P.P.A.

JAMES R. MUNRO, M. Inst. Power Eng.

FRANCIS E. MURRAY, B.Sc. (Alta.), Ph.D. (McGill), M. TAPPI, M. Tech. Sect. C.P.P.A.

RALPH H. PATTERSON, M.A.Sc. (Brit. Col.), Ph.D. (McGill), F.C.I.C., M. TAPPI, M. Tech. Sect. C.P.P.A.

DONALD L. STEWART, B.A.Sc. (Brit. Col.), P. Eng., M. Tech. Sect. C.P.P.A.

C. CRAIG WALDEN, M.A. (Sask.), Ph.D. (Minn.).

ELLIOT H. WOODRUFF, B.S. (Wash.), M.A.C.S., M. TAPPI.

Lecturer from another Department

JACK W. WILSON, M.S., Ph.D. (State Univ. of New York), Professor, Forestry.

Department of Civil Engineering

- W. D. FINN, B.E. (Nat. Univ. Ireland), M.Sc., Ph.D. (Washington), Assoc. M.Am.Soc.C.E., M.A.S.E.E., Professor and Head of the Department.
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- S. CHERRY, B.Sc.(C.E.) (Man.), M.S. (Illinois), Ph.D. (Bristol), P.Eng., M.Am.Soc.C.E., M.E.I.C., Associate Professor.
- S. H. DE JONG, M.Sc. (Man.), P.Eng., D.L.S., B.C.L.S., M.E.I.C., Associate Professor.
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- R. F. HOOLEY, B.A.Sc. (Brit. Col.), M.Sc., Ph.D. (Stanford), P.Eng., M.I.A.B.S.E., M.E.I.C., Associate Professor.
- N. D. NATHAN, B.Sc. (Witwatersrand), S.M. (M.I.T.), Associate Professor.
- E. RUUS, Grad. Tallinn, Estonia, Dr. Eng. (Karlsruhe, Germany), P.Eng., M.Am.Soc.C.E., M.E.I.C., Associate Professor.
- SEMIH TEZCAN, M.Sc., Ph.D. (Istanbul), P.Eng., M.Am.Soc.C.E., M.E.I.C., Associate Professor.
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Department of Electrical Engineering

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- E. V. BOHN, Dipl. Math., Dr. Rer. Nat. (Göttingen), Mem.I.E.E.E., Professor.
- F. K. BOWERS, M.A. (Cantab.), Mem.I.E.E.E., Professor.
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- JACK DOUGLAS, B.A.Sc. (Brit. Col.), Sen.Mem.I.E.E.E., M.E.I.C., Senior Instructor.
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- JOHN H. DRINNAN, B.A.Sc. (Brit. Col.), M.Sc. (Illinois Inst. Tech.), P.Eng., Honorary Lecturer.
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- K. H. KIDD, M.A.Sc. (Toronto), P.Eng., Honorary Lecturer.
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- MICHAEL PAVICH, B.A.Sc. (Brit. Col.), M.Eng. (McGill), P.Eng., Honorary Lecturer.
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- M. A. THOMAS, B.A.Sc. (Brit. Col.), P.Eng., Honorary Lecturer.
- GIDEON WILLONER, Dipl.Ing., Dr.Sc.Tech. (Tech. Vienna), P.Eng., Honorary Lecturer.

Department of Mechanical Engineering

- J. P. DUNCAN, B.Eng., M.Eng. (Adelaide), D.Sc. (Manchester), M.I. Mech.E., Professor and Head of the Department.
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- Z. ROTEM, Dipl. Ing. (Lausanne), D.Sc. (Israel Inst. of Tech.), Visiting Associate Professor.
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- V. J. MODI, B.E. (Bombay), D.I.I.Sc. (Ind. Inst. of Science), M.S. (Washington), Ph.D. (Purdue), P.Eng., Mem.A.S.M.E., Mem.A.I.A.A., Assistant Professor.
- H. RAMSEY, B.Sc. (Alta.), Ph.D. (Stanford), Assistant Professor.
- J. L. WIGHTON, B.A., B.A.Sc. (Brit. Col.), M.S.E., Ph.D. (Mich.), Assistant Professor.
- C. ROSEN, B.A.Sc., M.B.A. (Brit. Col.), P.Eng., Special Lecturer.
- V. W. RUSKIN, B.S. (London), M.Com. (Toronto), Ph.D. (London), P.Eng., Special Lecturer.
- S. P. SLINN, B.A.Sc. (Brit. Col.), P.Eng., Special Lecturer.
- B. BABICKI, M.Sc. (Warsaw), P.Eng., Part-time Lecturer.

Department of Metallurgy

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- F. A. FORWARD, B.A.Sc. (Toronto), P.Eng., F.I.M., F.C.I.C., M.Inst.M.M., M.C.I.M., Professor. (On leave of absence.)
- C. S. SAMIS, M.Sc. (Man.), Ph.D. (London), P.Eng., M.C.I.M., Professor.
- J. A. H. LUND, B.A.Sc. (Brit. Col.), Ph.D. (Birmingham), P.Eng., M.C.I.M., Associate Professor.
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- L. C. BROWN, A.R.C.S.T., Ph.D. (Glasgow), Assistant Professor.
- R. G. BUTTERS, M.A.Sc. (Brit. Col.), Assistant Professor.
- A. C. D. CHAKLADER, B.Sc. (Calcutta), Ph.D. (Leeds), A. I. Ceram., Assistant Professor.
- N. R. RISEBROUGH, M.A.Sc. (Toronto), Instructor.
- D. TROMANS, B.Sc., Ph.D. (Leeds), Research Associate.
- MRS. A. MARGARET ARMSTRONG, M.A. (Toronto), Lecturer.

Department of Mineral Engineering

- C. L. EMERY, M.Sc. (Queen's), Ph.D. (Sheffield), P.Eng., M.C.I.M., M.E.I.C., Professor and Head of the Department.
- LESLIE G. R. CROUCH, B.Sc. (Victoria, Australia), M.Sc. (Utah), P.Eng., M.C.I.M., Professor of Mining Engineering.
- HENRY M. HOWARD, B.A.Sc. (Toronto), P.Eng., M.C.I.M., Professor of Mineral Dressing.
- JAN LEJA, A.R.S.M., B.Sc. (London), Dip.Eng. (Krakow), Ph.D. (Cantab.), Professor.

FACULTY OF APPLIED SCIENCE

OUTLINE OF ENGINEERING COURSE PROGRAMME

Engineering studies in the Faculty of Applied Science follow a general pattern in which the first two years are devoted largely to the development of basic concepts in mathematics and physical sciences with some consideration of certain applied fields. In the final two years the work is concerned with application of the sciences in specific areas of engineering.

Entrance standards require that the student must have completed with high standing courses in mathematics and the sciences either in a university or by Grade 13. Practical work outside the University, scheduled field trips, and the activities of professional and technical societies all contribute to the rounding out of an engineering course and the student is expected to participate in them as fully as circumstances permit.

The degree of Bachelor of Applied Science is granted on completion of the work in one of the following courses:

1. Agricultural Engineering
2. Chemical Engineering
3. Civil Engineering
4. Electrical Engineering
5. Geological Engineering
6. Mechanical Engineering
7. Metallurgical Engineering
8. Mineral Engineering
9. Engineering Physics

Extension of engineering studies at the post-graduate level is becoming increasingly important. The Faculty offers post-graduate courses and provides research facilities in many areas of engineering for students proceeding to the degree of Master of Applied Science or Doctor of Philosophy.

The requirements for entrance to the M.A.Sc. and Ph.D. programmes are set out fully in the calendar of the Faculty of Graduate Studies. In general it may be stated that acceptance as a candidate for the M.A.Sc. degree requires a high level of accomplishment in the undergraduate course; a substantial programme of academic courses and research, occupying at least twelve months, must be completed to merit this degree. Acceptance as a candidate for the Ph.D. degree requires demonstrated academic and research ability; the programme of studies and research occupies at least two years' resident study beyond the level of the Master's degree. For both degrees competence in at least one additional language besides English is expected.

The specific offerings of the several Departments are described in the section devoted to Courses in Engineering.

Registration and Admission

The general requirements for admission to the University are given in the General Information bulletin.

For admission to courses in Engineering, a student must have completed the First Year in Science at the University of British Columbia or its equivalent at an approved university or by Grade 13.

Required subjects are:

English 100 (Literature and Composition)

Mathematics 120

Chemistry 102 or 110 (or 101 from Grade 13)

Physics 110 or 101

An elective chosen from courses offered in the Faculty of Arts

The passing grade for entrance to courses in Engineering in each of Mathematics, Chemistry and Physics, is 60 per cent., and 50 per cent. in other subjects.

Candidates who expect to complete the requisite entrance standing through University or Grade 13 supplemental examinations, held in August or September, may apply for admission and their applications will be considered subject to the results of these examinations.

No student with deficient standing will be admitted to the First or Second Year in any course in the Faculty.

Students considering Applied Science are advised to take First Year Science at a university because the Faculty feels strongly that students should adjust themselves to university before undertaking the difficult work in First Year Applied Science.

Students intending to enter Applied Science are advised to present Chemistry 12, Mathematics 12, and Physics 12 for Secondary School Graduation.

In order to allow time for practical work in the summer, the session is kept as short as is consistent with satisfactory mastery of the work. The student, therefore, should attend at the opening of session to assure a proper approach to the course.

If the summer employment either affords experience in the work of the course, or lightens the work of the session (as for example geological survey field work for geology students), and by its nature prevents the student attending the opening of the session, he may be allowed by the Dean to enter late, provided he furnishes a statement from his employer showing that it was impossible for him to release the student earlier. The student must, however, make application in writing to the Dean prior to the first day of registration. A fee for late registration will be charged.

Fees—Subject to change without notice

First Term Fees, \$290 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$551 at time of registration. Fourth Year students are assessed an additional \$7 to cover the graduating fee.

Second Term Fees, \$261, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting office before this date with a note showing name and registration number.

Examinations and Advancement

1. Examinations are held in December and in April. December examinations are obligatory in all subjects of the First and Second Years for all students in these years. December examinations in subjects of the Third and Fourth Years, excepting those subjects completed before Christmas, shall be optional with the departments concerned. Applications for special consideration on account of illness or domestic affliction must be submitted to the Dean as soon as possible after the close of the examination period. For information regarding medical certificates see the General Information bulletin.

2. Candidates, in order to pass, must obtain at least 50 per cent. in each subject; in courses including both lecture and laboratory work students will be required to pass in both the written examinations and laboratory work before standing in the subject will be granted. The grades are as follows: First Class, an average of 80 per cent. or over; Second Class, 65 to 79 per cent.; Pass, 50 to 64 per cent. In a subject in which a candidate has failed to obtain 50 per cent., the Faculty may, at its discretion, award a pass in that subject on the basis of a good aggregate standing. Such a pass will be entered on his record as an "adjudicated pass".

3. No student will be allowed to take any subject unless he has previously passed in, or secured exemption from, all prerequisite subjects.

4. A student who is required to repeat his year will not be allowed to take any work in a higher year. A student repeating his year need not repeat the laboratory work of certain courses if he has obtained a standing in this work acceptable to the head of the department in which the course is given.

5. A student who fails a second time in his University studies is required to withdraw.

6. Any student whose academic record, as determined by the tests and examinations of the first term, is found to be unsatisfactory, may be required to discontinue attendance at the University for the remainder of the session. Such a student will not be re-admitted to the Faculty as long as any supplementals are outstanding.

7. Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.

8. Honours graduate standing will be granted to those who obtain First Class Standing in the Final Year and who have obtained an average of at least 75 per cent., with no supplementals, in each of the preceding three years.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

Re-reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the

re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplemental Examinations

1. If a student's general standing in the final examinations of any year is sufficiently high, the Faculty may grant him supplemental examinations in the subject or subjects in which he has failed. Supplementals will not be granted in more than three subjects. Notice will be sent to all students to whom such examinations have been granted.

2. A candidate who has been granted a supplemental examination may write it only twice. Permission to write a third time may be given only if the course is repeated or an equivalent course taken. Tutoring approved by the Dean may be accepted as an equivalent course.

3. No student may enter the Third or higher year with supplementals still outstanding in more than 4 units of the preceding year, or with any supplemental outstanding in the work of an earlier year unless special permission to do so is granted by Faculty.

4. Supplemental examinations will be held in August and at the time of the regular April examinations. Special examinations will not be granted, except by special permission of the Faculty and on payment of a fee of \$20 per paper.

5. Applications for supplemental examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

6. Supplemental examinations may be written in August at the following centres: Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Pen-ticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of Christmas or mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments, may, on the recommendation of the Head of the Department, be excluded by the Dean of the Faculty from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students who, because of illness, are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees. (See the General Information bulletin.)

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Practical Work Outside the University

Before a degree will be granted, a candidate is required to satisfy the department concerned that he has completed a suitable amount of practical work related to his chosen profession.

Practical work such as shopwork, freehand drawing, mechanical drawing, surveying, etc., done outside the University may be accepted in lieu of laboratory or field work (but not in lieu of lectures) in these subjects, on the recommendation of the head of the department and with the approval of the Dean. Students seeking this exemption must make written application to the Dean before April 1.

Field Trips

Students who may be required to participate in field trips will be responsible for expenses incurred in such trips.

Professional Associations

In order to practise as a Professional Engineer in the Province of British Columbia, it is necessary to be registered as a member of the Association of Professional Engineers of the Province of British Columbia.

Students in Engineering should enroll with the Association in their Second Year and should associate themselves with the appropriate technical societies. Facilities for enrollment are available each fall at the University during the period of registration.

It is most important that the student, upon entering Third Year, should identify himself more closely with professional objectives and should establish clearly in his own mind the path he expects to follow in obtaining full professional recognition at a later date. At this time he should consult with the head of the department in which he proposes to enroll concerning the requirements for registration subsequent to graduation.

During the period between graduation and registration, the graduate should be enrolled with the Association of Professional Engineers in B.C. as an Engineer-in-Training.

CURRICULA

First and Second Years

No student with deficient standing will be admitted to First or Second Year Applied Science.

Students entering Second Year are required to submit an essay of not less than 1000 words. This should take the form of a scientific report based preferably upon original observations made during the summer. Any suitable subject, however, may be chosen. Emphasis will be placed upon the precise and accurate use of English, but credit will also be given for subject matter, form, and illustrations. If the essay is not up to the standard of a pass mark in English it will be returned for re-writing. One copy only is required, which may be retained for future reference by the department most interested. The essay shall be handed in to the Dean not later than October 15.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
F I R S T	First Year						
	Geol. 150 General Geology	2	2	..	2	2	..
	App. Sc. 152 Engineering Draw.	1	..	3	1	..	3
	Chem. 155 Anal. & Gen. Chem.	2	3	..	2	3	..
	Eng. 150 Composition	2	..	..	2	..	..
	Math. 155 Calculus	4	..	..	4	..	..
	Math. 156 Anal. Geom. & Algeb.	2	..	..	2	..	..
	Phys. 155 Mechanics	2	..	4	2	..	4
Phys. 156 Heat, Light, Sound	2	3*	..	2	3*	..	
S E C O N D	Second Year						
	App. Sc. 278 Materials Science	2	2*	..	2	2*	..
	Chem. 255 Physical Chemistry	2	..	2	2	..	2
	C.S. 251 Introd. to Computers and Programming	2	..	1	..	..	..
	Math. 250 Vector Analysis and Differential Equations	3	..	..	3	..	..
	Math. 251 Series and Elem. Stats.	2	..	..	2	..	..
	Phys. 250 Electricity and Magnetism ..	2	3	..	2	3	..
	Eng. 298 Essay .....	..	..	..	..	..	..
	Departmental Requirements .....	..	..	..	..	..	..

See page C19)

*Alternate weeks.

DEPARTMENTAL REQUIREMENTS

SECOND YEAR

In addition to the courses listed above, further work is required in the Second Year. The character of this work varies in some measure depending on the branch of engineering which the student intends to enter in the Third Year. The additional Second Year course requirements specified for entry to Third Year in the different branches are as follows:

Agricultural Engineering	Required: App. Sc. 270, Strength of Materials App. Sc. 275, Applied Mechanics Biol. 101, Biology *C.E. 250, Plane Surveying Chem. 230, Organic Chemistry Not required: Chem. 225, Math. 251
Chemical Engineering	Required: Chem. 230, Organic Chemistry Chem. 304, Physical Chemistry Ch.E. 250, Material Balances Not required: Chem. 255
Civil Engineering	Required: App. Sc. 270, Strength of Materials App. Sc. 275, Applied Mechanics *C.E. 250, Plane Surveying †Elective
Electrical Engineering	Required: App. Sc. 275, Applied Mechanics E.E. 251, Introd. to Circuit Analysis E.E. 253, Introd. to Solid State Electronics E.E. 255, Elect. Eng. Problems I Phys. 251, Electric and Magnetic Fields Not required: App. Sc. 278, Phys. 250
Geological Engineering	Required: App. Sc. 270, Strength of Materials *C.E. 250, Plane Surveying Geol. 204, Structural Geology Geol. 210, Mineralogy Not required: Math. 251
Mechanical Engineering Metallurgical Engineering Engineering Physics	Required: App. Sc. 270, Strength of Materials App. Sc. 275, Applied Mechanics †Elective
Mineral Engineering	Required: *C.E. 250, Plane Surveying Geol. 204, Structural Geology Min. 250, Introd. to Mineral Engineering Min. 260, Mineral Engineering Problems †Elective Not required: Math 251

*At end of Second Term, First Year.

†The elective course will be chosen from a list provided at registration.

THIRD AND FOURTH YEARS

Third Year Essays and Reports

All students entering Third Year Applied Science in other than Chemical Engineering are required to prepare an engineering report or essay. Detailed information on form, content and dates for submission of preliminary and final copies is contained in the "Instructions for Preparation of Engineering Reports" issued to each student at the end of Second Year.

Fourth Year Essays, Reports and Theses

Refer to departmental requirements.

Options in Third and Fourth Years

In some departments selected groups of courses are offered as options which represent different areas of interest, some designed for students who prefer the approach to engineering practice or operation, others for students who are inclined to the more mathematical or scientific aspects of engineering or who may be considering a career in research and development. In some departments the options or electives are intended to offer a choice of field without distinction between applied and scientific concepts. High quality performance in any option or field qualifies the student to continue his studies at the graduate level if he chooses to do so. All students entering Third Year must consult with representatives of the departments concerned before registering for the courses offered.

I. Agricultural Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term			
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.	
T H I R D	Third Year							
	M.E. 352 Mechanical Drawing	} Prior to entry to Third Year						
	or							
	C.E. 350 Applied Plane Surveying							
	Math. 350 Differential Equations		3	3
	Math. 355 Programming and Numerical Algorithms	2
	Math. 357 Industrial Statistics & Linear Programming	2
	Pl. Sc. 321 Biometrics		3	2
	M.E. 363 Machine Design I		2	..	2	2	..	2
	M.E. 372 Mechanical Testing	3	3	..
	M.E. 373 Appld. Thermodynamics		2	2
	M.E. 381 Fluid Mechanics		2	..	1	2	..	1
	A.E. 375 Heat Transfer		2	..	3*	2	..	3*
	A.E. 385 Agric. Engineering Anal.	2
A.E. 398 Engineering Report .....	..		..	..	..	..	..
Soil Sc. 313 Soil Physics	2	2	..	..	..	..
An. Sc. 320 Animal Physiology	2	2	..	2	2	..		
F O U R T H	Fourth Year							
	A.E. 450 Field Problems	At end of 2nd Term, 3rd Year						
	A.E. 489 Seminar .....	..	..	2*	..	..	2*
	A.E. 499 Thesis .....	..	3	..	..	3	..
	E.E. 451 Electrical Circuits	2	2*	2*	2	2*	2*	
	Pl. Sc. 344 Physiology of Crops	2	2	..	2	2	..	
	OPTION I: MACHINERY AND PROCESSING							
	M.E. 463 Machine Design II	2	..	3	2	..	3	
	M.E. 491 Industrial Administ.	2	..	..	2	..	..
	A.E. 470 Agricultural Machines	2	3	..	2	3	..	
	A.E. 480 Agric. Prod. Processing	2	3*	..	2	3*	..	
	and one of:							
	M.E. 361, E.E. 367, Microbiol. 200							
	OPTION II: STRUCTURES, SOIL AND WATER							
C.E. 370 Structural Design I	2	..	2	2	..	2		
C.E. 476 Law in Engineering .....	..	..	..	1	..	..
A.E. 460 Soil and Water Engin.	2	3	..	2	3	..		
A.E. 465 Agricultural Structures	2	3*	..	2	3*	..		
and one of:								
C.E. 367, C.E. 453, C.E. 467								

*Alternate weeks.

2. Chemical Engineering

For Second Year Curriculum, see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	Third Year						
	Chem. 352 Modern Analytical Methods	1	3	..	1	3	..
	Chem. 457 Advanced Physical Chemistry	3	..	..	3	..	..
	Eng. 305 Literature of Ideas	1	..	1	1	..	1
	Math. 350 Differential Equations	3	..	..	3	..	..
	Math. 355 Programming and Numerical Algorithms	2	..	..	..	..	..
	E.E. 451 Electrical Circuits	2	2*	2*	2	2*	2*
	Ch.E. 352 Transport Phenomena	3	..	2*	3	..	2*
	Ch.E. 353 Mechanical and Thermal Operations	1	..	2*	1	..	2*
	Ch.E. 354 Cascades	1	..	..	1	..	..
	Ch.E. 355 Applied Thermodynamics	2	..	3*	2	..	3*
	Ch.E. 360 Chem. Eng. Laboratory .....	..	3	..	..	3	..
	Ch.E. 398 Chemical Technology .....	..	..	..	Summer reading		
F O U R T H	Fourth Year						
	Ch.E. 450 Diffusional Operations	2	..	1	2	..	1
	Ch.E. 452 Control of Process Variables	1	..	..	1	..	..
	Ch.E. 453 Plant Design and Economics	2	..	2	2	..	2
	Ch.E. 455 Chem. Eng. Reactor Design	2	..	..	2	4	..
	Ch.E. 457 Seminar .....	..	..	1	..	..	1
	Ch.E. 458 Properties of Fluids	1	..	..	1	..	..
	Ch.E. 460 Chem. Eng. Laboratory .....	..	12	..	..	..	..
	Ch.E. 498 Summer Essay .....	..	..	..	Summer task		
	Ch.E. 499 Thesis .....	..	3	..	..	9	..
†Electives, technical and general	6	..	..	6	..	..

*Alternate weeks.

†Electives to be chosen in consultation with Department. Mathematics 357 may be taken in Third Year.

3. Civil Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	Third Year						
	Math. 350 Differential Equations	3	..	..	3	..	..
	Math. 355 Programming & Numerical Algorithms	2	..	..	..	..	..
	C.E. 351 Engineering Surveying .....	..	..	..	3	..	..
	C.E. 355 Strength of Materials II	3	..	..	3	..	..
	C.E. 356 Engineering Materials	1	3*	..	1	3*	..
	C.E. 360 Fluid Mechanics I	2	2*	2*	2	2*	2*
	C.E. 367 Soil Mechanics I	2	2*	..	2	2*	..
	C.E. 370 Structural Design I	2	..	2	2	..	2
	C.E. 371 Structural Theory I	2	..	..	2	..	..
C.E. 398 Essay .....	..	..	..	..	..	..
F O U R T H	Fourth Year						
	†C.E. 450 Engineering Surveys	At end of 2nd Term, 3rd Year					
	C.E. 453 Photogrammetry	2	..	3	..	..	..
	C.E. 455 Structural Theory II	2	..	..	2	..	..
	C.E. 460 Structural Design II	2	..	2	2	..	2
	C.E. 465 Municipal Engineering	2	..	2	2	..	2
	C.E. 466 Water Power .....	..	..	..	2	..	2*
	C.E. 467 Fluid Mechanics II	2	..	..	..	..	..
	C.E. 470 Transportation Engineering	2	..	..	2	..	..
	C.E. 472 Soil Mechanics II	2	..	..	2	..	..
C.E. 476 Law in Engineering .....	..	..	..	1	..	..
†C.E. 451 Control Surveys	3	..	3*	3	..	3*	

*Alternate weeks.

†Consult Department for requirements in Surveying.

‡Elective course.

Note: In special circumstances and with permission of the Department Head, a student may substitute a graduate or an undergraduate course for an undergraduate course in the Fourth Year.

4. Electrical Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term			
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.	
T H I R D	Third Year							
	E.E. 355 Circuits and Signal Analysis ..	3		2	3		2	
	E.E. 357 Electronic Devices	2	3*	2*	2	3*	2*	
	E.E. 398 Essay .....	..	..	..	..	..	..
	Math. 355 Programming & Numerical Algorithms .....	..	..	..	2	..	..
	M.E. 492 Engineering Economics	2	..	..	..	..	..
	OPTION I: ELECTRICAL ENGINEERING							
	Math. 350 Differential Equations	3	..	..	3	..	..
	E.E. 353 Electrical Machinery	2	3*	2*	2	3*	2*	
	E.E. 361 Electromagnetics	2	..	2*	2	..	2*	
	E.E. 367 Electrical Measurements	1	2*	2*	1	2*	2*	
	M.E. 371 App. Thermodynamics	2	..	..	2	..	..
	M.E. 374 Thermodynamics Lab. ....	..	3*	..	..	3*	..
	OPTION II: ELECTRICAL ENG. SCIENCE							
	Math. 360 Real Variable	2	..	..	2	..	..
	Math. 362 Linear Algebra	2	..	..	2	..	..
	Math. 364 Complex Variable	2	..	..	2	..	..
	Phys. 456 Classical Mechanics	2	..	..	2	..	..
E.E. 371 Electrodynamics	2	..	2	2	..	2		
E.E. 373 Experimental Lab. I .....	..	4*	..	..	4*	..	
F O U R T H	Fourth Year							
	E.E. 467 Engineering Systems	2	..	2*	2	..	2*	
	E.E. 469 Distributed Parameter Circuits	2	..	2*	2	..	2*	
	E.E. 475 Electronic and Communications Systems	2	3	2*	2	3	2*	
	E.E. 498 Essay .....	..	..	..	..	..	..
	OPTION I: ELECTRICAL ENGINEERING							
	C.E. 360 Fluid Mechanics I	2	2*	2*	2	2*	2*	
	Phys. 472 Modern Physics	2	..	..	2	..	..
	E.E. 455 Engineering Problems	1	3*	2	1	3*	2	
	E.E. 463 Power Systems	2	3*	2	2	3*	2	
	OPTION II: ELECTRICAL ENG. SCIENCE							
	Math. 452 Differential Equations	3	..	..	3	..	..
	Phys. 452 Atom. and Nucl. Phys.	3	..	..	3	..	..
	Phys. 455 Thermodynamics and Stat. Mechanics	3	..	..	3	..	..
Phys. 456 Classical Mechanics	2	..	..	2	..	..
E.E. 471 Energy Conversion	2	3*	2*	2	3*	2*		
E.E. 473 Systems Laboratory .....	..	3*	3*	..	3*	3*	

*Alternate weeks.

5. Geological Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	C.E. 350 Plane Surveying	At end of 2nd Term, 2nd Year					
	C.E. 453 Photogrammetry	2	..	3	..	..	..
	Geophysics 300 Physics of the Earth	2	..	..	2	..	..
	Geol. 210 Mineralogy	2	3	..	2	3	..
	Geol. 303 Optical Mineralogy	2	2	..	..	..	..
	Geol. 307 Pet. and Natural Gas	2	..	..	2	..	..
	Geol. 317 Petrology .....	..	..	..	2	2	..
	†Geol. 410 Field Geology .....	..	..	..	..	2	..
	Min. 398 Engineering Report .....	..	..	..	..	..	..
	OPTION I: GEOLOGICAL ENGINEERING						
	C.E. 367 Soil Mechanics I	2	2*	..	2	2*	..
	Geol. 306 Palaeontology	2	2	..	2	2	..
	Min. 351 Mineral Exploration	2	..	2	2	..	2
	Min. 371 Mineral Dressing	1	3*	..	1	3*	..
	OPTION II: GEOPHYSICS						
	E.E. 361 Electromagnetics	2	..	2*	2	..	2*
	E.E. 363 Electronics	2	..	3*	2	..	3*
	Math. 350 Differential Equations	3	..	..	3	..	..
	Geophysics 301 Waves	3	..	2*	3	..	2*
	OPTION III: ENGINEERING GEOLOGY						
C.E. 360 Fluid Mechanics I	2	2*	2*	2	2*	2*	
C.E. 367 Soil Mechanics I	2	2*	..	2	2*	..	
Math. 350 Differential Equations	3	..	..	3	..	..
F O U R T H	Geol. 401 Stratigraphy	2	2	..	2	2	..
	Geol. 407 Petrography	2	3	..	2	3	..
	Geol. 499 Thesis .....	..	3	..	..	3	..
	OPTION I: GEOLOGICAL ENGINEERING						
	Geol. 408 Mineral Deposits	3	..	..	3	..	..
	Geol. 409 Mineralography	1	3	..	..	4	..
	Min. 457 Rock Mechanics	2	1	..	2	1	..
	Geophys. 400 Exploration Geophysics	2	..	..	2	..	..
	Geophys. 402 Applied Geophysics Lab. .....	..	3	..	..	3	..
	OPTION II: GEOPHYSICS						
	Geol. 408 Mineral Deposits	3	..	..	3	..	..
	Geol. 409 Mineralography	1	3	..	..	4	..
	Math. 450 Analysis	3	..	..	3	..	..
	Geophys. 401 Applied Geophysics	2	..	..	2	..	..
	Geophysics 402 Applied Geophysics Lab. ....	..	3	..	..	3	..
	and one of	..	..	..	..	..	..
	Geophysics 403 Geochronology	2	..	..	..	..	..
	Physics 405 Elasticity	2	..	..	..	..	..
	OPTION III: ENGINEERING GEOLOGY						
	C.E. 472 Soil Mechanics II	2	..	..	2	..	..
C.E. 476 Law in Engineering .....	..	..	..	1	..	..
Geol. 412 Geomorphology	2	2	..	2	2	..	
Min. 457 Rock Mechanics	2	1	..	2	1	..	
C.E. 560 Rivers and Harbours	2	..	..	..	..	..
and one of	..	..	..	..	..	..
Geophysics 301 Waves	3	..	2*	3	..	2*	
E.E. 451 Electrical Circuits	2	2*	2*	2	2*	2*	

*Alternate weeks.

†Includes 3 weeks' field work after lectures in second term.

6. Mechanical Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	Third Year						
	M.E. 352 Mechanical Drawing	At end of 2nd Term, 2nd Year					
	Eng. 305 Literature of Ideas	1	..	1	1	..	1
	Math. 350 Differential Equations	3	..	..	3	..	..
	Met. 376 Physical Metallurgy	2	..	..	2	..	..
	Met. 377 Physical Met. Lab. ....	..	2*	..	..	2*	..
	M.E. 361 Mechanics I	1	..	2	1	..	2
	M.E. 363 Machine Design I	2	..	2	2	..	2
	M.E. 398 Engineering Report .....	..	..	..	..	..	..
	OPTION I: ENGINEERING PRACTICE						
	E.E. 351 A.C. Circuits	2	3*	3*	2	3*	3*
	M.E. 357 Production Methods	1	3*	..	1	3*	..
	M.E. 372 Mech. Measurements .....	..	3	..	..	3	..
	M.E. 373 App. Thermodynamics	2	..	..	2	..	..
	M.E. 381 Fluid Mechanics	2	..	1	2	..	1
	OPTION II: ENGINEERING SCIENCE						
	E.E. 363 Circuits and Electronics	2	..	3*	2	..	3*
	Math. 355 Programming & Numerical Algorithms	2	..	..	..	..	..
	Math. 357 Statistics and Programming .....	..	..	..	2	..	..
	M.E. 376 Mechanical Laboratory .....	..	3	..	..	3	..
M.E. 383 Mechanics & Thermo-dynamics of Fluids	3	..	3*	3	..	3*	
F O U R T H	Fourth Year						
	M.E. 463 Machine Design II	2	..	3	2	..	3
	M.E. 465 Mechanics II	2	..	3*	2	..	3*
	M.E. 466 Automatic Controls	1	..	..	1	..	..
	M.E. 472 Mech. Eng. Laboratory .....	..	3	..	..	3	..
	M.E. 498 Engineering Report .....	..	..	..	..	..	..
	OPTION I: ENGINEERING PRACTICE						
	E.E. 453 D.C. and A.C. Machines	2	3*	3*	2	3*	3*
	Math. 355 Programming & Numerical Algorithms	2	..	..	..	..	..
	M.E. 455 Industrial Engineering	1	..	3*	1	..	3*
	M.E. 471 Process Thermodynamics	2	..	3*	2	..	3*
	M.E. 479 Thermal Power	2	..	3*	2	..	3*
	M.E. 491 Industrial Administration	2	..	..	2	..	..
	OPTION II: ENGINEERING SCIENCE						
	E.E. 465 Applied Electronics	2	2	1	2	2	1
	Math. 450 Analysis	3	..	..	3	..	..
	M.E. 475 Thermodynamics & Heat Transfer	3	..	3*	3	..	3*
M.E. 481 Aerodynamics	3	1*	2*	3	1*	2*	

*Alternate weeks.

7. Metallurgical Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	Third Year						
	Ch.E. 350 Transport Processes	2	..	1*	2	..	1*
	Math. 350 Differential Equations	3	..	..	3	..	..
	M.E. 367 Applied Mechanics	2	..	3	..	..	..
	Phys. 372 Atomic Physics	2	..	..	2	..	..
	Min. 371 Mineral Dressing	1	3*	0	1	3*	0
	Met. 350 Met. Thermodynamics I .....	..	..	..	2	..	..
	Met. 351 Laboratory Methods .....	..	3*	..	..	3*	..
	Met. 352 Process Met. I	2	..	..	2	..	..
	Met. 353 Metallurgical Calc. I .....	..	..	2	..	..	2
	Met. 370 Structure of Metals I	2	..	..	2	..	..
	Met. 371 Physical Metallurgy Laboratory I .....	..	3*	..	..	3*	..
	Met. 382 Non Metallic Materials I .....	..	..	..	2	3	0
	Met. 390 Seminar I .....	..	..	1	..	..	1
Met. 398 Engineering Report .....	..	..	..	..	..	..
F O U R T H	Fourth Year						
	Met. 450 Metallurgical Thermo- dynamics II	2	..	..	2	..	..
	Met. 451 Metallurgy Laboratory .....	..	3*	..	..	3*	..
	Met. 452 Process Met. II	2	..	..	2	..	..
	Met. 453 Metallurgical Calc. II .....	..	..	3	..	..	3
	Met. 455 Research Project .....	..	6	..	..	6	..
	Met. 470 Structure of Metals II	2	..	..	2	..	..
	Met. 471 Physical Metallurgy Laboratory II .....	..	3*	..	..	3*	..
	Met. 474 Metal Fabrication I	2	..	..	2	..	..
	Met. 490 Seminar II .....	..	..	1	..	..	1
	Met. 498 Engineering Report .....	..	..	..	..	..	..
	Plus (5) units chosen from the following; not less than (2) units in Met. courses.						
	Met. 456 Hydromet. and Kinetics	1	..	..	1	..	..
	Met. 458 Phys. Chem. of Metal Surfaces	1	..	..	1	..	..
	Met. 460 Struct. of Metal Compounds	1	..	..	1	..	..
	Met. 478 Electron Theory	1	..	..	1	..	..
	Met. 482 Non-Metallic Materials II	1	..	..	1	..	..
**Met. 561 Nuclear Metallurgy	1	..	..	1	..	..
**Met. 586 Electron Microscopy	1	..	..	1	..	..
Math. 450 Analysis	3	..	..	3	..	..
Phys. 352 Mathematical Physics	2	..	..	2	..	..
Chem. 407 Adv. Phys. Chemistry	3	..	..	3	..	..

*Alternate weeks.

**Offered to Fourth Year students only with the permission of the Head of the Department.

8. Mineral Engineering

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	Third Year						
	C.E. 350 Plane Surveying	At end of	2*	2*	2nd Term,	2nd Year	2*
	C.E. 360 Fluid Mechanics	2	2	..	2	2*	2*
	Geol. 300 Intro. to Mineralogy	2	..	..	..	..	..
	Geol. 317 Petrology .....	..	..	..	2	2	..
	Math. 350 Differential Equations	3	..	..	3	..	..
	Math. 355 Programming	2	..	..	..	..	..
	Min. 350 Mineral Exploration	1	..	..	1	..	..
	Min. 352 Environmental Control .....	..	..	3	..	..	..
	Min. 353 Methods Studies .....	..	..	..	2	..	..
	Min. 370 Mineral Dressing I	2	..	..	2	..	..
	Min. 390 Seminar .....	..	..	1	..	..	1
Min. 398 Engineering Report .....	..	..	..	..	..	..
F O U R T H	Fourth Year						
	Math. 355 Programming	2	..	..	..	..	..
	M.E. 491 Industrial Adminis.	2	..	..	2	..	..
	Met. 372 Physical Metallurgy	1	..	..	1	..	..
	Min. 452 Valuation	3	..	..	..	..	..
	Min. 453 Systems Analysis .....	..	..	..	3	..	..
	Min. 460 Advanced Eng. Problems ..	..	..	3	..	..	3
	Min. 480 Research or Design Project ..	..	3	..	..	6	..
	Min. 490 Seminar .....	..	..	1	..	..	1
	Min. 498 Engineering Report .....	..	..	..	..	..	..
	OPTION I: ROCK MECHANICS						
	Min. 455 Metrology	2	..	..	2	..	..
	Min. 456 Rock Mechanics	2	..	..	2	..	..
	Electives (Six units, from Economics, Business, Geology, etc.)						
	OPTION II: MINERAL PROCESSING						
	Met. 350 Met. Thermodynamics I .....	..	..	..	2	..	..
	Met. 456 Hydrometallurgy & Kinetics ..	1	..	..	6	..	..
Met. 460 Structure of Metal Compounds	1	..	..	1	..	..
Min. 470 Mineral Dressing II	2	3	..	2	3	..	
Min. 471 Surface Properties	2	..	..	2	..	..
Elective (3 units from Chemistry, Electronics, Business)							

*Alternate weeks.

9. Engineering Physics

For Second Year Curriculum and reference to options see pages C18 and C19.

Year	Subject	First Term			Second Term		
		Lect.	Lab.	Prob.	Lect.	Lab.	Prob.
T H I R D	Third Year	At end of 2nd Term, 2nd Year					
	M.E. 352 Mechanical Drawing	2	..	3*	2	..	3*
	E.E. 363 Circuits and Electronics	2	..	..	..	..	..
	Math. 355 Programming and Numerical Algorithms	2	..	..	..	..	..
	Math. 360 Real Variable	2	..	..	2	..	..
	Math. 362 Linear Algebra	2	..	..	2	..	..
	Math. 364 Complex Variable	2	..	..	2	..	..
	Phys. 351 Elec. and Mag.	2	..	..	2	..	..
	Phys. 352 Mathematical Physics	2	..	..	2	..	..
	Phys. 358 Physical Optics	2	3	..	2	3	..
	Phys. 398 Essay .....	..	..	..	..	..	..
	and one of: .....	..	..	..	..	..	..
	Chem. 230 Organic Chemistry	3	3	..	3	3	..
	Ch.E. 352 Transport Phenomena	3	..	..	3	..	..
	E.E. 453 D.C. and A.C. Machines	2	3*	3*	2	3*	3*
	Geol. 204 Structural Geology	2	3	..	2	3	..
M.E. 383 Mechanics of Fluids	3	..	3*	3	..	3*	
Met. 374 Physical Metallurgy I	2	3*	..	2	3*	..	
F O U R T H	Fourth Year						
	E.E. 465 Applied Electronics	2	2	1	2	2	1
	Math. 452 Differential Equations	3	..	..	3	..	..
	Phys. 405 Elasticity	2	..	..	..	..	..
	Phys. 409 Experimental Physics .....	..	6	..	..	6	..
	Phys. 452 Atom. and Nucl. Phys.	3	..	..	3	..	..
	Phys. 455 Therm. and Stat. Mech.	3	..	..	3	..	..
	Phys. 456 Classical Mechanics	2	..	..	2	..	..
	†Phys. 458 Fluid Mechanics .....	..	..	..	2	..	..
	Phys. 480 Seminar .....	..	..	1	..	..	1
	and one of: .....	..	..	..	..	..	..
	Chem. 412 Phys. Inorg. Chem.	2	..	..	2	..	..
	{ Ch. E. 450 Diffusional Operations	2	..	1	2	..	1
	{ †Ch.E. 354 Cascades	1	..	..	1	..	..
	{ E.E. 467 Engineering Systems	2	..	2*	2	..	2*
{ Geophys. 401 Applied Geophysics	2	..	..	2	..	..
{ Geol. 317 Petrology .....	..	..	..	2	2	..	
{ M.E. 481 Aerodynamics	3	1*	2*	3	1*	2*	
{ Met. 472 Physical Metallurgy II	2	3*	..	2	3*	..	

*Alternate weeks.

†Students who take M.E. 383 as their option in Third Year may replace Phys. 458 with M.E. 466, or with any other Fourth Year option.

‡May be taken in Third Year.

COURSES IN ENGINEERING

Note: The following subjects may be modified during the year as the Senate deems advisable.

The hours assigned for laboratory and lectures in the course are designated as shown by the following examples:

- 2 lectures and 3 hours laboratory per week, both terms. [2-3-0; 2-3-0]
 1 lecture per week and 3 hours laboratory in alternate weeks, both terms. [1-3*-0; 1-3*-0]
 2 lectures and 3 hours per week alternately laboratory and problem, both terms. [2-3*-3*; 2-3*-3*]
 1 lecture and 3 hours per week problem, both terms. [1-0-3; 1-0-3]
 1 lecture and 2 hours laboratory per week, first term. [1-2-0; 0-0-0]
 1 lecture per week first term, 2 hours laboratory second term. [1-0-0; 0-2-0]

Where no definite times are assigned for laboratory and lectures, the number of units for which credit will be granted is shown in parentheses after the course number.

Agricultural Engineering

375. Heat Transfer.—Basic principles of heat transfer, applications to process equipment and building design for agriculture. Solar insolation and micro-climatology. Textbook: Kreith, *Principles of Heat Transfer*. [2-0-3*; 2-0-3*]

385. Agricultural Engineering Analysis.—Application of engineering sciences to problems encountered in the agricultural industry. Textbook: Ver Plank and Teare, *Engineering Analysis*. [0-0-0; 0-0-2]

398. Engineering Report.—See page C20.

450. Field Work.—A study of engineering problems encountered in the various phases of agriculture. Work commences at the close of the spring examinations and continues for two weeks.

460. Soil and Water Engineering.—Theory and practices in land drainage. Irrigation practices and principles. Engineering in soil conservation and land reclamation. Textbooks: Frevert, et al, *Soil and Water Engineering*; Israelsen, *Irrigation Principles and Practices*. [2-3-0; 2-3-0]

465. Agricultural Structures.—Functional planning, design, construction and environmental control in structures for plant and animal production. [2-3*-0; 2-3*-0]

470. Agricultural Machines.—The application of engineering principles in the development and design of power units and agricultural machines. Use of electric power; handling of agricultural materials. Textbooks: Barger et al, *Tractors and their Power Units*; Bainer et al, *Principles of Farm Machinery*. [2-3-0; 2-3-0]

480. Agricultural Products Processing.—The unit operations pertaining to processing of agricultural products. Size reduction, separation, mixing, evaporation and drying, refrigeration. [2-3*-0; 2-3*-0]

489. Seminar.—Papers, and discussions on recent agricultural engineering developments. [0-0-2*; 0-0-2*]

499. Thesis.—For B.A.Sc. Degree. [0-3-0; 0-3-0]

Animal Science

An. Sc. 320. Animal Physiology.—A study of the anatomy and physiology of farm animals; physiological implications concerned with animal growth, reproduction and lactation. Prerequisites: Chemistry 200 or 205.

[2-2-0; 2-2-0]

Applied Science

The courses listed in this section are given by combined Departments in Applied Science as arranged by the Dean of the Faculty.

152. Engineering Drawing.—Orthographic projection, technical sketching, engineering geometry, standards and conventions of the graphic language, graphic solution of space problems and the production of working drawings.

[1-0-3; 1-0-3]

270. Strength of Materials.—An introductory course dealing with elementary relations existing between external forces and accompanying stresses, strains and deflection produced in simple types of structural and machine elements.

[2-0-1; 2-0-1]

275. Applied Mechanics.—A study of kinematics and kinetics of particles and rigid bodies.

[2-0-1; 2-0-1]

278. Materials Science.—Introduction to atomic theory and theory of the solid state; crystal structure; metals, ceramics and polymers, the relation between structure and properties; mechanical, electrical, magnetic, chemical and nuclear properties of materials. Textbook: Van Vlack, *Elements of Materials Science*.

[2-2*-0; 2-2*-0]

Biology

101. (3) Principles of Biology.—An introductory course emphasizing principles of wide application to all living organisms, including cell structure and function, the mechanism of inheritance, evolution, and adaptation to environment. A comparative approach to the unity and diversity of organisms will be stressed. A one hour tutorial is required each week for those students who have not previously had Biology 11 or its equivalent in high school. (For prerequisite purposes Biology 12, Biology 105, Botany 105, or Zoology 105 will be considered equivalent to Biology 101.)

[3-3-0; 3-3-0]

Chemical Engineering

250. Material Balances.—Stoichiometry; estimation of process design data; phase equilibria, psychrometry; fuels and combustion. Textbook: Hougen, Watson, and Ragatz, *Chemical Process Principles*, Part I.

[1-0-2*; 1-0-2*]

350. Transport Processes.—Macroscopic mass, heat and momentum balances; kinetics of fluid flow, heat transfer and mass transfer. Textbook: Bennett and Myers, *Momentum, Heat, and Mass Transfer*.

[2-0-1*; 2-0-1*]

352. Transport Phenomena.—Momentum, energy and mass transfer in solids, in laminar and turbulent fluid flow, and between two phases; theory of molecular and eddy viscosity, thermal conductivity and diffusivity; microscopic and macroscopic equations of motion, dimensional analysis; radiant heat transfer. Textbook: Bennett and Myers, *Momentum, Heat, and Mass Transfer*.

[3-0-2*; 3-0-2*]

353. Mechanical and Thermal Operations.—Principles of comminution and screening; of fluo-solid operations including filtration, sedimentation, classification, fluidization, and differential wetting; and of thermal operations such as evaporation, and crystallization. [1-0-2*; 1-0-2*]

354. Cascades.—The theory of reversible and irreversible stagewise separations. Textbook: Foust, et al, *Principles of Unit Operations*. [1-0-0; 1-0-0]

355. Applied Thermodynamics.—Application of fundamental physical relationships to vapour pressures, psychrometry, thermophysics and thermochemistry. Laws of thermodynamics; physical and chemical equilibrium; fuels and combustion, process energy balances, power cycles, expansion and compression of fluids, refrigeration. Textbook: Hougen, Watson, Ragatz, *Chemical Process Principles*, Parts 1 and 2. [2-0-3*; 2-0-3*]

360. Chemical Engineering Laboratory.—Experiments based on material presented in 250, 352, 353, 354, 355; plant visits. [0-3-0; 0-3-0]

398. Chemical Technology.—During the summer preceding entry into the Third Year of the Chemical Engineering course summer reading on the more important chemical processes is required. An examination will be set on the Saturday of registration week. Special arrangements may be made for candidates entering from other universities.

450. Diffusional Operations.—Principles of mass-transfer operations including absorption, distillation, humidification, extraction, drying, and adsorption. Textbook: Treybal, *Mass-Transfer Operations*. [2-0-1; 2-0-1]

452. Control of Process Variables.—Theory and application of automatic control in chemical processes; process dynamics; instrumentation. Textbook: Eckman, *Automatic Process Control*. [1-0-0; 1-0-0]

453. Plant Design and Economics.—Economics of chemical engineering processes, optimisation of operating conditions, choice of auxiliary equipment. Exercises in plant design. [2-0-2; 2-0-2]

455. Chemical Engineering-Reactor Design.—Chemical reaction, kinetics, catalytic processes, and reactor design. Textbook: Levenspiel, *Chemical Reaction Engineering*. [2-0-0; 2-4-0]

457. Seminar.—Discussion on thesis work in progress. [0-0-1; 0-0-1]

458. Properties of Fluids.—Thermodynamic and kinetic properties of fluids. Relationships useful in engineering. Prediction of properties. [1-0-0; 1-0-0]

459. (3) Major Design Problem.—The annual student contest of the American Institute of Chemical Engineers will be used as an integrated design problem. Enrolment is subject to departmental approval. (Elective.)

460. Chemical Engineering Laboratory.—Experiments in unit operations, instrumentation, and other topics. Plant visits. [0-12-0; 0-0-0]

470. Pulp and Paper Technology.—Pulp and paper processing viewed from a chemical engineering standpoint. Includes material on wood chemistry and structure, pulping, bleaching, pulp treatment, paper-making, and the structure, testing and uses of pulp and paper. (Elective.) [2-0-0; 2-0-0]

498. Summer Essay.—During the summer preceding entry to the Fourth Year of the Chemical Engineering course, an essay must be prepared. This should be written on some subject of scientific or technical interest, and should preferably report personal experience. The essay must be submitted to the office of the Department one week after the first day of lectures.

499. Thesis.—Research or design under the direction of a staff member. [0-3-0; 0-9-0]

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites—Graduation or equivalent in Chemical Engineering, or graduation in Mechanical Engineering, Metallurgical Engineering, or the Chemical Engineering option of Engineering Physics.

Course—Must include Chemical Engineering 598, and at least five additional units chosen from graduate courses in the Department, and from 3 to 6 units for approved courses outside the Department, to a total of 12 units. Thesis 6 units.

Ph.D. Degree:

The Department offers facilities for research studies in the following fields:

- (a) Mass, momentum, and heat transfer.
- (b) Chemical engineering unit operations.
- (c) Applied thermodynamics and kinetics.

550. (1-2) **Industrial Kinetics and Catalysis.**—Chemical reaction kinetics and catalytic processes; heat and mass transfer in industrial reactors; design of catalytic converters.

551. (1-2) **Chemical Engineering Thermodynamics.**—Pressure-volume-temperature relations; chemical equilibria by Gibbs' method; vapor-liquid equilibria; thermodynamic calculations by third law and quantum-statistical methods.

552. (1-2) **Optimization Methods.**—The mathematical and experimental techniques for optimizing processes will be discussed. Course content will vary from year to year, but will be chosen from the topics: direct search techniques, unconstrained optimization, Jacobian and Lagrangian optimization, mathematical programming, and variational calculus techniques.

553. (1-2) **Mathematical Operations in Chemical Engineering.**—Topics to be discussed will vary from year to year. Amongst these will be dimensional analysis and model theory; treatment and interpretation of chemical engineering data; formulation and solution of differential and finite difference equations; graphical, numerical and statistical methods.

554. (1-2) **Momentum, Heat and Mass Transfer.**—Prediction of velocity, temperature, and concentration profiles for flowing fluids; unifying concepts and analogies in momentum, heat, and mass transport; streamline flow and turbulence, molecular and eddy conduction and diffusion, boundary layers, smooth and rough conduits and other boundaries. References: Bird, Stewart and Lightfoot, *Transport Phenomena*, and current literature.

555. (1-2) **Solvent Extraction and Gas Absorption.**—Mass transfer in liquid-liquid and gas-liquid systems. Design of extraction and of absorption columns for height and for diameter. Gas-liquid and liquid-liquid equilibria. References: Treybal, *Liquid Extraction*; Sherwood and Pigford, *Absorption and Extraction*; and current literature.

556. (1-2) **Distillation.**—Systems of complete and of limited miscibility; multicomponent systems; graphical and analytical design methods; azeotropic and extractive distillation.

557. (1-3) **Fluid and Particle Dynamics.**—Review of vector and tensor analysis; Navier-Stokes equations; discussions on topics which may include hydrodynamic stability, turbulence, non-Newtonian flow, and gas, liquid and solid particle mechanics.

558. (1-2) **Process Heat Transfer.**—Steady state and transient state studies; calculation and design of industrial heat exchangers.

559. (1-3) Topics in Chemical Engineering.—A discussion of some aspects of modern Chemical Engineering. Subject matter varies each year.

598. (1) Seminar.—Presentation and discussion of current topics in chemical engineering research.

599. (6) Thesis.—For M.A.Sc. degree.

699. Thesis.—For Ph.D. degree.

Chemistry

155. Analytical and General Chemistry.—Chemical laws, chemical equilibrium, equilibrium applied to ionization. Atomic and molecular theory. Selected topics in inorganic chemistry such as co-ordination compounds, metal carbonyls, intermetallic compounds, clathrates. Colloidal chemistry. Oxidation and reduction reactions. Descriptive inorganic chemistry. Nuclear chemistry. Organic chemistry. [2-3-0; 2-3-0]

230. Organic Chemistry.—The fundamental principles of modern organic chemistry, including a discussion of the main classes of organic compounds. Prerequisite: Chemistry 110, 102 or 101. [3-3-0; 3-3-0]

255. Physical Chemistry.—Gases, chemical thermodynamics, liquids, solids, atomic and molecular structure, phase equilibria, solutions of non-electrolytes and of electrolytes, electrochemistry, chemical kinetics, catalysis. [2-0-2; 2-0-2]

304. Physical Chemistry.—Elementary thermochemistry, thermodynamics, and electrochemistry; elementary quantum theory; atomic spectra; atomic and molecular structure; states of matter; chemical equilibria; chemical kinetics; colloid chemistry. Prerequisites: Chemistry 200 or 205 (or Physics 200) and Mathematics 202 or 220. Mathematics 300 or 323 concurrently is recommended. [3-3-0; 3-3-0]

352. Modern Analytical Methods.—An introduction to modern methods of analysis including optical, electrochemical and radiochemical methods, mass spectrometry, magnetic resonance spectrometry and chromatography. [1-3-0; 1-3-0]

407. Advanced Physical Chemistry.—Chemical thermodynamics; electrochemistry; elementary statistical mechanics, atomic and molecular structure; chemical kinetics; catalysis; surface phenomena; colloids; photochemistry. (Students in Metallurgy exempt from laboratory part of course.) Prerequisites: Chemistry 304 or 305; Mathematics 300 or 323. [3-0-0; 3-0-0]

412. Physical Inorganic Chemistry.—Modern theories of valency. Chemical properties of elements and their compounds from the point of view of simple atomic and molecular structure. Prerequisites: Chemistry 304 and 310. [2-0-0; 2-0-0]

457. Advanced Physical Chemistry.—Chemical thermodynamics; elementary statistical mechanics; electrochemistry; atomic and molecular structure; chemical kinetics; catalysis; surface phenomena; colloids; photochemistry. [3-0-0; 3-0-0]

For descriptions of other courses in Chemistry, see the Faculty of Science calendar.

Civil Engineering

250. Plane Surveying.—Theory of construction, adjustment and application of surveying instruments. Plane surveying problems involving compass, transit, tape, level and plane table. Reduction of field data; and compilation of maps and plans from notes and calculations. Work commences at the close of the spring examination and continues for twelve days, eight hours a day, or equivalent. Textbook: Brinker and Taylor, *Elementary Surveying*. Mr. Anderson.

350. Applied Plane Surveying.—Solar observation for latitude and azimuth. Stellar observation for azimuth at any hour angle. Route survey, including preliminary and final location. Survey of mineral (lode) claims involving fractions. Simple triangulation with repeating instruments. Modern surveying techniques and instruments. Adjustments of transit and level. Work commences immediately following close of spring examinations, occupying twelve eight-hour days, or equivalent. Textbook: Brinker and Taylor, *Elementary Surveying*. Mr. Pretious.

351. Engineering Surveying.—Plane surveying methods and applications to construction, route locations, earthworks and other engineering projects; limitations, relative advantages, estimated accuracies and other factors affecting choice of best method; solar and stellar determination of azimuth; types and propagation of error; control surveys and their adjustment; special and modern methods, apparatus and applications. Mr. Heslop, Mr. Bell.

[0-0-0; 3-0-0]

355. Strength of Materials II.—An extension of App. Sc. 270 to meet the needs of Civil Engineering students, involving both elastic and inelastic analysis of structural members subject to various types of loadings and supports. Mr. Cherry.

[3-0-0; 3-0-0]

356. Engineering Materials.—Properties of and standard specifications and tests for wood, steel, cement, concrete and bitumens. The manufacture and metallurgy of steels. Welding metallurgy. Cables. The manufacture of Portland Cement. Mineral aggregates. The design of concrete mixtures. Asphaltic mixtures. Quality control. Mr. Heslop.

[1-3*-0; 1-3*-0]

360. Fluid Mechanics I.—Physical properties of fluids, fluid statics, kinematics of fluid flow, energy equation for steady flow of any fluid, viscosity, dimensional analysis, dynamic similarity, flow of compressible and incompressible fluids, fluid-measuring instruments, impulse and momentum, resistance of immersed bodies, flow in open channels, hydraulic machinery. Textbook: Streeter, *Fluid Mechanics*. References: Freeman, *Hydraulic Laboratory Practice*; Schoklitsch, *Hydraulic Structures*. Mr. Pretious. [2-2*-2*; 2-2*-2*]

367. Soil Mechanics I.—An introduction to the physical and mechanical properties of soil that govern its behaviour as an engineering material. Textbook: T. William Lambe, *Soil Testing for Engineers*. Mr. Campanella.

[2-2*-0; 2-2*-0]

370. Structural Design I.—An introduction to structural design in timber, steel and concrete; tension and compression members, beams, connections, simple roof trusses; typical design calculations and preparation of drawings; use of codes and specifications. Textbook: To be announced. Mr. Anderson.

[2-0-2; 2-0-2]

371. Structural Theory I.—An introduction to the theory of Structural Analysis. Graphical and analytical methods. Textbook: Timoshenko and Young, *Theory of Structures*. Mr. Tezcan.

[2-0-0; 2-0-0]

398. Essay.—See page C20.

450. Engineering Surveys.—Route surveying, curves and earthworks; triangulation; instrument adjustment; azimuth determination; topographic mapping; modern techniques and instruments.

[2-0-0; 2-0-0]

451. Control Surveys.—Introduction to the shape of the earth and its effect on survey accuracy and computation. Survey orientation and position determination. Distance measurement by electronic means and reduction of field measurements to mean sea level datum. Precise traversing, triangulation and trilateration. Resection. Strength of figure, intervisibility of stations, computation of geodetic position, map projections and plane coordinates. Geodetic leveling. Textbook to be announced. Mr. de Jong.

[3-0-3;* 3-0-3*]

453. **Photogrammetry.**—The principles of terrestrial and aerial photogrammetry; photogrammetric problems and map compilation from aerial photographs, using radial triangulation; parallax measurement and height determination; principles of automatic plotting machines; field trips. Textbook: Moffitt, *Photogrammetry*. Mr. Bell. [2-0-3; 0-0-0]

455. **Structural Theory II.**—Further development of the theory of Structural Analysis with emphasis on indeterminate systems. Textbook: Timoshenko and Young, *Theory of Structures*. Mr. Hooley. [2-0-0; 2-0-0]

460. **Structural Design II.**—Working stress and ultimate load design of reinforced concrete beams, columns, slabs and footings; design of steel plate girder and truss bridges; design of parts of industrial and multistory buildings under various loading conditions. Mr. Lipson. [2-0-2; 2-0-2]

465. **Municipal Engineering.**—Physical and economic factors of sewerage and sewage treatment, water supply, town planning and city management. Textbook: Steel, *Water Supply and Sewerage*. Reference: Lewis, *City Planning*. [2-0-2; 2-0-2]

466. **Water Power Development.**—Principles of hydrology; selection of hydraulic turbines and centrifugal pumps; hydro-electric installations. Textbook: Doland, *Hydro Power Engineering*. Mr. Ruus. [0-0-0; 2-0-2*]

467. **Fluid Mechanics II.**—Basic hydrodynamics of non-viscous and viscous fluids. Lift and drag, conformal mapping, boundary layer theory, separated flows and wakes and selected engineering applications. Textbook: Vallentine, *Applied Hydrodynamics*. Mr. Singh. [2-0-0; 0-0-0]

470. **Transportation Engineering.**—Principles of traffic engineering, geometric design of highways, intersections, interchanges, and terminals. Traffic planning and assignment. Economic studies. Textbook: Matson, Smith and Hurd, *Traffic Engineering*, Mr. Peebles. [2-0-0; 2-0-0]

472. **Soil Mechanics II.**—Examination of the nature and degree of validity of the theories of soil mechanics (first term). Application of theories to analysis of behaviour of retaining walls; foundations of various kinds; caissons; cofferdams; natural and man-made slopes; earth dams (second term). Readings from the technical literature will be assigned during the year. Mr. Finn. [2-0-0; 2-0-0]

476. **Law in Engineering.**—Certain fundamental aspects of law encountered in the work of the engineer; with emphasis on Contract Law and Specifications. Preparation of engineering contract documents including specifications, Torts and Independent Contractor, Sources of Law and major subdivisions. Companies, partnerships, mechanics liens, agency, evidence, expert witness. Textbook: Laidlaw, Young and Dick, *Engineering Law*. Reference: Abbett, *Engineering Contracts and Specifications*. Mr. Pretious. [0-0-0; 1-0-0]

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites—Graduation in Civil Engineering.

Course—Includes at least 6 units chosen from graduate courses in the Department, and other approved courses.

Note: All courses listed are not necessarily offered each year.

Ph.D. Degree:

Facilities are provided for study in the general fields of structural engineering, hydraulics, and soil mechanics; studies in cognate fields will be selected in consultation with the candidate's committee.

550. (1½) **Advanced Strength of Materials.**—Beams on elastic foundations; beam-columns; trigonometric series; centre of twist; shear deflection; buckling of columns by integration and energy methods; buckling of circular beams. Mr. Hrennikoff.

551. (1) **Lattice Models I.**—Replacement of two and three dimensional elastic members by lattice work of one dimensional elements; plane stress and plane strain; types of cells; effect of Poisson's ratio; solution of lattice work; conversion of stresses. Mr. Hrennikoff.

552. (1) **Lattice Models II.**—Bending of plates by lattice method; types of cells for different Poisson's ratios; solution of lattice work and conversion of stresses. Application to cylindrical and other shells. Prerequisite: C.E. 551. Mr. Hrennikoff.

553. (1½) **Theory of Plates.**—A study of stress distribution in flat plates by Fourier Analysis, finite differences, models, and the stiffness matrix approximation. Stability of compressed plates. Textbook: Timoshenko and Woinowsky-Kreiger, *Theory of Plates and Shells*. Mr. Hooley.

554. (1½) **Theory of Shells.**—A study of the stress distribution and stability of various shell forms. Textbook: Flugge, *Stresses in Shells*. Mr. Hooley.

555. (1) **Energy Theorems of Structural Mechanics.**—Configuration space; generalized co-ordinates; holonomic and non-holonomic systems. Virtual work, virtual displacements; Fourier's inequality; stationary potential energy principle; Lagrangian multipliers; equilibrium; stability of equilibrium; matrix formulation of energy theorems. Canonical forms; generalized forms of Castigliano theorems; theorems of complementary energy. Calculus of variations. Variational theorem for mixed boundary value problems. Mr. Finn.

556. (1) **Elasticity and Visco-elasticity.**—Introduction to linear theories of elasticity and visco-elasticity and their application to engineering problems; stress and displacement fields; creep; stress relaxation; visco-elastic models; transformation of visco-elastic problems to avail of existing elastic solutions; solution inversion. Mr. Finn.

557. (1) **Numerical Procedures in Structural Analysis.**—Numerical and approximate methods for the solution of complex problems with wide application to engineering structures; moments and deflections of beams and beam-columns, moments and deflections of beams on elastic supports, critical buckling loads of bars of variable cross section loaded in various ways, vibrations of elastically supported mass systems. Mr. Cherry.

558. (1½) **Inelastic Bending and Plastic Design I.**—Stresses and deformations in beams beyond the elastic limit; limit design; rigid plastic theory and its theorems; non-rigid plastic theory; plastic analysis by the mechanisms method; plastic moment distribution; deflections; effect of normal load and shear. Mr. Hrennikoff.

559. (1½) **Inelastic Bending and Plastic Design II.**—Repeated loading; alternating plasticity and incremental failure; shakedown. Exact theory of inelastic bending. Non-rigid plastic theory; English and American approaches; beam-columns; design of individual members and connections. Weaknesses of plastic theory. (Prereq. C.E. 558.) Mr. Hrennikoff.

560. (1) **Hydraulic Engineering for Rivers, Harbours and Coasts.**—Mobile boundary flow in sediment-bearing alluvial channels, and the laws relating to the geometry of their self formation. River morphology and sediment transport. Channel-bed scour at obstructions. River training and develop-

ment for navigation. Coastal protection. Water waves and tides. Behaviour of tidal estuaries. Harbour planning and protection. Use of scale models. Mr. Pretious.

561. (1) **Unsteady Flow in Closed Conduits I.**—Analyses of water hammer in penstocks and in pump discharge lines; influence of friction; optimum gate closure. Mr. Ruus.

562. (1) **Unsteady Flow in Closed Conduits II.**—A study of various single and multiple surge tanks by analytical, graphical and numerical methods; stability. Mr. Ruus.

563. (1) **Open-channel Hydraulics.**—Advanced topics in steady flow; surge waves in power canals, in locks and navigation canals; flood routing. Mr. Ruus.

564. (1) **Hydrology I.**—Introduction, weather, rainfall and measurements, snow and snow survey, ice and glaciers, streamflow, evaporation and transpiration, groundwater, sedimentation as applicable to hydrology. Textbook: *Hydrology for Engineers*, Linsley, Kohler and Paulhus. Mr. Singh.

565. (1½) **Hydraulic Structures.**—Requirements, limiting criteria, performance and design problems of dams and embankments; external load systems, foundations and form of dams vs. performance; hydraulic, economic and construction problems; current theories, practice and potential developments. Mr. Wisnicki.

566. (1) **Governing of Hydraulic Turbines.**—Speed regulation of hydraulic turbines. Analyses of speed rise and analyses of turbine governing stability. (Prereq. C.E. 561.) Mr. Ruus.

567. (1) **Advanced Fluid Mechanics I.**—Basic hydrodynamics of viscous and non-viscous incompressible fluid flow: boundary layer theory, conformal transformation, lift and drag and simple applications of these theories. Mr. Singh.

568. (1) **Advanced Fluid Mechanics II.**—Free surface waves, tidal theory and estuary resonance. An introduction to turbulence theory. Interaction of fluids and structures. (Prereq. C.E. 567.) Mr. Singh.

569. (1) **Hydrology II.**—Infiltration, runoff relations, hydrographs, stream-flow routing, statistical hydrology, applications of hydrologic techniques. (Prereq. C.E. 564.) Mr. Singh.

570. (1) **Advanced Reinforced Concrete Design.**—Elastic and plastic deformations in reinforced concrete, torsional stresses in beams, ultimate load design. Mr. Lipson.

571. (1) **Prestressed Concrete.**—Design and analysis for flexure and shear, losses in prestress, anchorage zone stresses, deflections, composite beams, statically indeterminate beams. Mr. Lipson.

572. (1) **Concrete Technology.**—A study of cement, aggregates and other concrete materials; mix design methods; control and testing; a review of current literature on concrete with regard to strength, workability, volume change, durability, porosity and permeability. Mr. Heslop.

573. (1) **Yield Line Theory of Concrete Slabs.**—Stress-strain relation in concrete; ultimate strength of reinforced concrete beams; yield line formation; distributed and concentrated loads; solution by statics and virtual work. Mr. Hrennikoff.

580. (1) **Vibrations of Structures, I.**—Fundamental analysis for the behaviour of structures and structural elements subjected to dynamic loading;

free and forced vibrations and transient response of structures treated as lumped and distributed parameter systems. Mr. Cherry.

581. (1) **Vibrations of Structures, II.**—Vibrations of frame and multi-storey buildings, bridges, cables, beams, columns and plates; propagation of stress waves in elastic solids; approximate and numerical methods for evaluating dynamic structural response. (Prereq. C.E. 580.) Mr. Cherry.

582. (1) **Fundamentals of Matrix Structural Analysis.**—Introduction to stiffness and flexibility influence coefficients; member stiffness and flexibility equations; orthogonal transformation; stiffness matrix of the main structure; computer application of the matrix methods to plane frame analysis. Mr. Tezcan.

583. (1) **Applications of Matrix Structural Analysis.**—The design of general matrix programs for use on a digital computer and their application in calculating the stress resultants in various structures, plates, and shells. (Prereq. C.E. 582.) Mr. Hooley.

584. (1) **Fortran Programming and Advanced Topics in Structures.**—The programming techniques for stiffness analysis of structures; treatment of special cases; large structures; complete automation; space frames; input, computation and output phases; finite element approach for the analysis of plates and shells; demonstration and discussion. (Prereq. C.E. 582.) Mr. Tezcan.

585. (1) **Structural Theory.**—Selected topics in classical structural analysis. Mr. Hooley.

586. (1) **Non-Linear Structures.**—Analysis of non-linear structures such as arches, suspension bridges, and guyed towers. Mr. Hooley.

590. (1) **Soil Mechanics I.**—Basic soil properties; classification; subsurface exploration; permeability; capillarity; seepage; flow nets; compression and consolidation; stresses in soil. Mr. Finn.

591. (1) **Soil Mechanics II.**—Settlement analysis; strength theory; direct and triaxial shear machines; stability of slopes; lateral pressure and retaining walls; application of soil mechanics to dams; bearing capacity of soil. (Prereq. C.E. 590.) Mr. Finn.

592. (1) **Soil Engineering for Transportation Facilities.**—Colloid theory and base exchange phenomena; structure and stability of compacted soils; compaction; swelling of soils, influence of compaction methods on swelling and stability; effect of repeated loadings on clay soils; resilience; rheological properties of clays; evaluation of subgrades and bases by empirical and rational methods; soil stabilization. Mr. Campanella.

593. (1) **Advanced Topics in Soil Mechanics.**—Stress distributions in soil masses under various boundary conditions; soil dynamics; wave types; wave transmission characteristics; dynamic response; correlation of response with engineering properties; foundation design for dynamic loads; general plastic theory of equilibrium; stability according to various criteria. (Prereq. C.E. 590, C.E. 591, or equivalent.) Mr. Finn.

594. (1) **Principles of Pavement Design.**—The application of soil mechanics to the design of flexible and rigid highway and airport pavements. Limitations of the various design methods now in general use and of the ways of evaluating soil strength and controlling construction. Textbook: Yoder, *Principles of Pavement Design*. Mr. Heslop.

595. (1) **Geometric Design of Highways.**—Traffic capacity and geometric design of rural highways, arterial highways in urban areas, intersections at grade and grade separation interchanges. Mr. Peebles.

596. (1½) **Geometric Geodesy I.**—Geometry of the spheroid; computation of position on spheroidal surfaces; relation between geoid and spheroid; Laplace correction; Legendre's theorem; geodetic levelling. Textbooks: Clark, *Plane and Geodetic Surveying*, Vol. II.; Bomford, *Geodesy*. Mr. Bell.

597. (1½) **Geometric Geodesy II.**—Geodetic triangulation, trilateration, traversing and base measurements; least square adjustment of observations; mathematics of map projections. Textbooks: Clark, *Plane and Geodetic Surveying*, Vol. II.; Bomford, *Geodesy*. (Prereq. C.E. 596.) Mr. Bell.

598. (½-3) **Topics in Civil Engineering.**—Lectures and readings on specialized topics of current interest in the field of civil engineering. To be given on approval of the Head of the Department.

599. Thesis.—For the M.A.Sc. degree. (3 or 6 units.)

699. Thesis.—For the Ph.D. degree.

Computer Science

251. **Introduction to Computers and Programming.**—Computer organization, binary number systems, algorithms and flow charting, introduction to an automatic programming language. [2-0-1; 0-0-0]

Electrical Engineering

251. **Introduction to Circuit Analysis.**—The formulation and solution of the equilibrium equations for lumped linear circuits using classical methods; superposition integrals and transfer functions. [2-2*-2; 2-2*-2]

253. **Introduction to Solid State Electronics.**—Elementary aspects of the properties of conductors, semiconductors, insulators and magnetic materials relevant to electrical engineering, together with their application in electric circuit devices. [2-2*-2*; 2-2*-2*]

255. **Electrical Engineering Problems I.**—An introduction to the methods of solution of electrical engineering problems using digital computers. Examples will be drawn from concurrent electrical engineering courses. [0-0-0; 2-0-2]

351. **Alternating Current Circuits and Electronics.**—Single-phase and poly-phase alternating current circuits; power measurements. Theory and application of electron tubes and semiconductor devices. [2-3*-3*; 2-3*-3*]

353. **Electrical Machinery.**—The theory, operating characteristics, and applications of electrical machines. [2-3*-2*; 2-3*-2*]

355. **Circuit and Signal Analysis.**—The analysis of representative classes of networks, including mechanical circuits. The application of spectral resolution of waveforms in the determination of responses to arbitrary excitations. Introduction to signal processing. [3-0-2; 3-0-2]

357. **Electronic Devices.**—Theory and application of active and passive elements in amplifiers, oscillators, modulators, detectors and related devices used in computers, communications, instrumentation and control. [2-3*-2*; 2-3*-2*]

361. **Electromagnetics.**—Field concepts, potential theory, electrodynamics, radiation. [2-0-2*; 2-0-2*]

363. **Introduction to Circuit Theory and Electronics.**—Lumped elements, vacuum and semiconducting devices. [2-0-3*; 2-0-3*]

367. **Electrical Measurements.**—Resistors, inductors and capacitors, their construction and calibration; D.C. bridges and potentiometers; galvanometers and standard cells; magnetic measurements; indicating instruments and energy meters; oscillographs, A.C. bridges. [1-2*-2*; 1-2*-2*]

371. Engineering Electrodynamics.—Introduction to vector analysis; magnetostatic and electrostatic fields; the properties of dielectric and magnetic materials; energy and forces in static fields; electromagnetic fields; relationship between field and circuit concepts; Poynting's theorem; stationary devices exploring fields for storing, transforming and controlling the flow of energy. [2-0-2; 2-0-2]

373. Experimental Laboratory I.—A laboratory study of the phenomena and devices of electrical engineering, with emphasis on measuring techniques and the experimental verification of the results of analysis and numerical computation. Some opportunity for independent experimentation is provided. [0-4*-0; 0-4*-0]

389. Summer Essay.—An essay, between 1000 and 2500 words in length, is due in the Department Office by October 15. This essay should be related to the student's summer experience in engineering. However, an essay based on any technical or scientific subject will be accepted, provided that the approval of a faculty member has been obtained. The original and one copy will be required. The original will be retained by the Department.

438. Building Services (Electrical).—Principles of electrical services and illumination of buildings. For students in Architecture. [0-0-0; 3-0-0]

451. Electrical Circuits and Apparatus.—D.C. and A.C. circuits and machinery; theory and application of electron tubes. Textbook: Fitzgerald and Higginbotham, *Basic Electrical Engineering*. [2-2*-2*; 2-2*-2*]

453. D.C. and A.C. Machines.—The theory and characteristics of direct current generators and motors, and alternating current machines, transients in electromechanical systems. [2-3*-3*; 2-3*-3*]

455. Engineering Problems.—The analysis of engineering systems, with emphasis on laboratory experiments and problems. [1-3*-2; 1-3*-2]

463. Power Systems.—Components of electrical power systems, generators, transformers, transmission lines, converters and inverters. System performance. [2-3*-2; 2-3*-2]

465. Applied Electronics.—The theory and application of electronic devices. [2-2-1; 2-2-1]

467. Engineering Systems.—Introduction to the Laplace transform and its application to the evaluation of system responses. Relationships between system parameters and system responses. Feedback systems, stability, graphical methods of analysis, system optimization. The response of distributed parameter electrical and mechanical systems. [2-0-2*; 2-0-2*]

469. Distributed Parameter Circuits.—The application of electromagnetic theory and of circuit theory to the study of such devices as transmission lines, waveguides, antennas and some classes of microwave tubes. [2-0-2*; 2-0-2*]

471. Energy Conversion.—Electro-mechanical conversion of energy through the medium of electric and magnetic fields; the relationships between forces, voltages and energy in linear transducers; analysis by the methods of classical dynamics; derivation of the electro-mechanical differential equations of the generalized machine using the equations of dynamics and electromagnetic theory; applications to specific classes of machines; development of equivalent circuits and transfer functions for use in system studies. [2-3*-2*; 2-3*-2*]

473. Systems Laboratory.—Problems and laboratory experiments on electro-mechanical, electronic communication and control systems. [0-3*-3*; 0-3*-3*]

475. Electronic and Communication Systems.—Multi-stage amplifiers, feedback amplifiers, oscillators, modulation, frequency conversion, pulse circuits, analogue and digital system design and realization. [2-3-2*; 2-3-2*]

498. **Essay.**—An essay, between 1000 and 2500 words in length, is due in the Department Office by October 15. This essay should be related to the student's summer experience in engineering. However, an essay based on any technical or scientific subject will be accepted, provided that the approval of a faculty member has been obtained. The original and one copy will be required. The original will be retained by the Department.

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites — Graduation in Electrical Engineering or Engineering Physics.

Course—Includes a thesis and at least 12 units of approved courses, 6 units of which must be at the graduate level within the Department and 3 units in other Departments.

Ph.D. Degree:

Facilities are provided for research and study in: power systems, communications, control systems, energy conversion, non-linear systems, electronic circuits, medical electronics, thin-film electronics, microwave, network theory, and computers.

Students should consult the Department for information regarding courses to be offered in 1966-67.

551. (2) **Applied Electromagnetic Theory.**—Basic relations, concepts and theorems; Green's functions; transverse electromagnetic waves; transmission lines, cylindrical and surface waveguides; problems involving plane-wave, cylindrical-wave and spherical-wave functions; perturbational and variational techniques and applications; radiation.

553. (2) **Electric Power Systems.**—The theory of energy flow, electrically long transmission lines, generalized circuit constants and graphical analyses. Synchronous machines as elements of a power system, stability and surge phenomena. Special problems of extra high voltage transmission. Computer studies of power systems.

557. (2) **Non-linear Systems.**—Analytical and graphical techniques applied to non-linear and time-varying systems. Stability via Liapunov's Direct Method. Applications to engineering problems.

559. (1) **Electronic Instrumentation.**—Theory and design of pulse circuits for generating, amplifying and measuring non-sinusoidal wave forms; applications in communication, instrumentation and control. Textbook: Millman and Taub, *Pulse and Digital Circuits*.

561. (2) **Network Theory.**—Analysis and synthesis of linear electrical networks.

563. (2) **Theory of Automatic Control.**—Linear feedback systems. Synthesis of optimum time-invariant linear systems. Theory of optimal control of linear and non-linear systems based on the principle of optimality and the calculus of variations.

565. (2) **Communication Theory.**—Axiomatic formulation of probability theory, random variables and functions of random variables, random processes; correlation functions and power density spectra, sampling theory, central limit theorem. Karhunen-Loève expansion, transmission of signals through linear and non-linear systems, optimum systems; introduction to coding theory and to the statistical theory of signal detection. An introduction to the statistical theory of communication; correlation methods for the detection of signals in noise; optimization of linear systems.

567. (1) Analogue Computers.—The electronic and electromechanical components used in analogue computation. Specialized circuitry and methods for function generation, multiplication and the solution of trigonometric problems. Various types of analogue computers and their applications in communications and control systems. Network analogues.

569. (2) Logic Design.—Representation of logic functions, use of Boolean algebra, systematic simplification of expressions, realization by electronic circuits. Sequential machines, state reduction, state assignments. Selected problems on logic design.

571. (1-2) Electrical Engineering Seminar and Special Problems.

573. (2) Design of Electric Machines.—Advanced course in machine design. General relations and their applications to specific types of machines using digital and analogue methods.

577. (2) Matrix Analysis of Electrical Machines.—Tensor concepts applied to electrical engineering problems; the theory of generalized machines; coordinate transformations for various reference frames; the analysis of power and control machines; the synchronous machine and power system problems.

579. (1) Solid-State Electronics.—Theory and measurement of simplifying properties and noise performance of parametric amplifiers, tunnel diodes, masers, lasers and other solid-state devices of current interest.

581. (2) Electrodynamics.—Field tensors; Maxwell's equations and relativity theory; electron ballistics using Lagrangian and Hamiltonian mechanics; space-charge waves in electron beams; Cherenkov radiation.

583. (2) Microwave Measurements and Techniques.—Theory and techniques for the measurement of wavelength and frequency, impedance, attenuation, Q -factor, power, receiver and transmitter characteristics, antenna characteristics and properties of materials.

585. (2) Antennas and Radio Propagation.—Elementary dipole and loop antennas. Parabolic and other reflectors. Antenna arrays. Interferometer techniques. Noise temperature of antennas. Propagation of radio waves. Applications to broadcasting, microwave links, satellite communications, and radio astronomy.

587. (2) Thin Film and Solid-State Electronic Devices.—Theory of electronic states and conductivity in semiconductors. Defects in crystals and ionic transport processes. Technique of thin films. Fabrication and theory of operation of various solid state devices. Integrated and thin film circuitry.

591. (2) Engineering Applications of Analogue and Hybrid Computers.—Programming of system equations, time and amplitude scaling, optimization techniques, partial differential equations, application to the study of control systems.

593. (1) Instrumentation for Radio-Astronomy.—Dish antennas and antenna arrays. Interferometers. Aperture synthesis and supersynthesis. Low-noise preamplifiers. Multi-channel receivers. Smoothing and data reduction. This course complements Physics 570, which deals with observations and theories resulting from radio-astronomical work. [2-0-0; 0-0-0]

599. Thesis.—For M.A.Sc. degree.

699. Thesis.—For Ph.D. degree.

English

150. Composition.—The work consists of (1) essays, class exercises, and selected reading; (2) written examinations. Students will be required to make a passing mark in each. [2-0-0; 2-0-0]

305. **Literature of Ideas.**—Selected readings in great writers of the past and present. For a full description of the course students should apply to their faculty office. [1-0-1; 1-0-1]

For descriptions of other courses in English, see the Faculty of Arts calendar.

Geology

150. **General Geology.**—Physical and historical geology covering materials of the earth, geological structures and processes, mineral deposits, erosion, and the history of the earth and its inhabitants. For engineering students only. Textbook: Leet and Judson, *Physical Geology*, 3rd edition. Reference: Dunbar, *Historical Geology*, 2nd edition. Mr. Best. [2-2-0; 2-2-0]

204. (3) **Structural Geology.**—Primary and secondary structures in rocks; practice in solving structural problems. Text: Hills, *Elements of Structural Geology*, 1962. Prerequisite: Geology 150 or 105. Geology 300 or 210 concurrently. Mr. Ross. [2-3-0; 2-3-0]

210. (3) **Mineralogy.**—A comprehensive treatment of the more important crystal classes. Descriptive and determinative mineralogy. Elementary crystal chemistry. Text: Berry and Mason, *Mineralogy*. Prerequisites: Geology 150 or 105. Mr. Thompson. [2-3-0; 2-3-0]

300. (1½) **Introduction to Mineralogy.**—Methods of identification of minerals; the common rock-forming and ore minerals. Intended for General Course and Education students. Text: Dana, *Manual of Mineralogy*, 17th edition. Prerequisite: Geology 150 or 105. Mr. Warren. [2-2-0; 0-0-0]

303. (1½) **Optical Mineralogy.**—The theory and use of the polarizing microscope in identifying the non-opaque minerals. Text: Kerr, *Optical Mineralogy*. Prerequisite: Geology 150 or 105. Mr. Sinclair. [2-2-0; 0-0-0]

306. (3) **Palaeontology.**—Invertebrate, vertebrate and plant fossils, their classification, identification and evolutionary development. Text: Moore, Lalicker and Fischer, *Invertebrate Fossils*. Prerequisite: Geology 150 or 105. Mr. Best. [2-2-0; 2-2-0]

307. (2) **Petroleum, Natural Gas and Ground Water.**—Origin and occurrence of ground water, petroleum, natural gas and structural materials. Text: Levorsen, *Geology of Petroleum*. Prerequisites: Geology 150 or 105, Mathematics 202 or equivalent. Mr. Mathews and Mr. Murray. [2-0-0; 2-0-0]

317. (1½) **Petrology.**—The common rocks and the processes which formed them; determination of hand specimens. Text: Huang, *Petrology*. Prerequisite: Geology 300 or 210 and 204 to precede or accompany. Mr. Sinclair. [0-0-0; 2-2-0]

401. (3) **Stratigraphy and Sedimentation.**—Principles of stratigraphy, stratigraphic nomenclature, correlation, sedimentary environments, sedimentary rocks, litho and bio facies. Laboratory: field interpretation and correlation; sediment analysis; sedimentary structures, hand specimen and thin section study of sedimentary rocks. Prerequisites: Geology 204, 303, 306 and 317. Mr. Danner. [2-2-0; 2-2-0]

407. (3) **Petrology.**—The descriptive and interpretive study of igneous and metamorphic rocks. Text: Williams, Turner and Gilbert, *Petrography*. Prerequisites: Geology 303, 210, 317. Mr. McTaggart. [2-3-0; 2-3-0]

408. (3) **Mineral Deposits.**—Manner of occurrence, genesis, structure and distribution of the principal metallic and some non-metallic mineral deposits, with type illustrations. Text: Park and MacDairmid, *Ore Products*, 1964, Freeman. Prerequisite: Geology 204; 317 must precede or accompany. Mr. White. [3-0-0; 3-0-0]

409. (2) Mineralogy.—Study and recognition of the opaque minerals by the reflecting microscope; practice in the cutting, grinding, and polishing of ore specimens, and micro-chemical methods of determination. Texts: Schouten, *Determination Tables for Ore Microscopy*; Edwards, *Textures of the Ore Minerals*. Prerequisite: Geology 408 must precede or accompany this course. Mr. Thompson. [1-3-0; 0-4-0]

410. (1½) Field Geology.—Methods of observing, recording, and correlating geological facts in the field. Prerequisites: Geology 204, 210, and 317. Two hours a week in the second term and three weeks in the field at the close of examinations in the spring of the junior year. Limited to Honours and Engineering students. A fee of \$45 is payable in January. The fee covers room, board, and instruction at the Field School for 3 weeks. Transportation to and from camp and liability insurance is the responsibility of the students. Mr. White, Mr. Thompson. [0-0-0; 0-2-0]

412. (3) Geomorphology.—For advanced students in geography and geology; a study of the processes, principles, and laws of land formation, types of land forms, and their distribution. Text: Thornbury, *Principles of Geomorphology*, 1954. Prerequisite: Geology 204. Mr. Mathews. [2-2-0; 2-2-0]

499. Thesis.—For B.A.Sc. degree.—Topic to be approved by the Department.

Courses for Graduate Students

599. Thesis.—For M.A.Sc. degree.

699. Thesis.—For Ph.D. degree.

For descriptions of other courses in Geology, see the Faculty of Science calendar.

Geophysics

300. Physics of the Earth.—Elementary seismology; gravity and figure of the Earth; geomagnetism and aeronomy; geothermometry; tectono-physics and the structure and composition of the Earth. Textbook: Jacobs, Russell and Wilson, *Physics and Geology*. [2-0-0; 2-0-0]

301. Waves.—Ray theory of optics and seismology; interference, diffraction and polarization of sound and light waves. Examples will be directed towards geophysical applications. Prerequisite: Physics 200 or equivalent. (Credit will not be given both for this course and Physics 308.) [3-0-2*; 3-0-2*]

400. Applied Geophysics.—Intended primarily for Geophysics major and Geology students. Instrumentation, application and limitations of the gravity, magnetic, seismic, electrical and electromagnetic methods. Prerequisite: Physics 200 or equivalent. Geophysics 402 must be taken concurrently. [2-0-0; 2-0-0]

401. Applied Geophysics.—Application of potential fields to the interpretation of gravity, magnetic, electrical and electromagnetic measurements; instrumentation; filtering techniques for the reduction of geophysical data. Credit cannot be obtained for both this course and Geophysics 400. Prerequisites: Mathematics 410 or equivalent (may be taken concurrently). Geophysics 402 must be taken concurrently. [2-0-0; 2-0-0]

402. Applied Geophysics Laboratory.—Examples of the reduction and interpretation of field data illustrating Geophysics 400 and Geophysics 401. [0-3-0; 0-3-0]

403. Geochronology.—A description of age determination techniques, and the application of these techniques to geological problems. [2-0-0; 0-0-0]

599. (3-6) Thesis.—For M.A.Sc. degree.

For description of other courses in Geophysics see the Faculty of Science calendar.

Mathematics

155. **Calculus.**—Integration with applications; partial derivatives; multiple integrals; introduction to infinite series. [4-0-0; 4-0-0]

156. **Analytic Geometry and Algebra.**—Vector algebra and its application to solid analytic geometry; determinants; matrices; systems of linear equations; complex numbers. [2-0-0; 2-0-0]

250. **Vector Analysis and Differential Equations.**—Vector differentiation; divergence and Stokes' theorems; an introduction to ordinary differential equations. [3-0-0; 3-0-0]

251. **Series and Elementary Statistics.**—Taylor's formula; infinite series. Probability distributions; testing statistical hypotheses; estimation; analysis of variance. [2-0-0; 2-0-0]

350. **Applied Calculus and Differential Equations.**—Fourier series; ordinary and partial differential equations; Laplace transforms; matrices and matrix methods; finite differences; Bessel functions; orthogonality. Prerequisite: Mathematics 250. [3-0-0; 3-0-0]

355. **Programming and Numerical Algorithms.**—The concept of a stored-program computer; FORTRAN programming; algorithms for the solution of algebraic and differential equations. [2-0-0; 0-0-0] or [0-0-0; 2-0-0]

357. **Industrial Statistics and Linear Programming.**—Quality control; acceptance sampling; analysis of variance; linear programming. [2-0-0; 0-0-0] or [0-0-0; 2-0-0]

360. **Real Variable.**—Uniform convergence; orthogonal functions; Fourier series; ordinary differential equations; special functions. [2-0-0; 2-0-0]

362. **Linear Algebra.**—Vector spaces; linear transformations and matrices; quadratic forms; characteristic values and vectors; canonical forms. [2-0-0; 2-0-0]

364. **Complex Variable.**—Elementary functions; integration; Cauchy's theorem and formulas; Taylor and Laurent series; residues; conformal mapping; Laplace transforms. [2-0-0; 2-0-0]

450. **Analysis.**—Complex variables; numerical methods; partial differential equations. [3-0-0; 3-0-0]

452. **Theory and Applications of Differential Equations.**—Introduction to partial differential equations and boundary value problems. [3-0-0; 3-0-0]

Courses for Graduate Students

555. **Computer Programming.**—Basic principles of programming; machine language codes; symbolic programming; interpretive systems; automatic programming. [2-1-0; 0-0-0]

For descriptions of other courses in Mathematics, see the Faculty of Science calendar.

Mechanical Engineering

154. **Mechanical Drawing and Graphics.**—Pencil and ink work in orthographic drawing, lettering, technical sketching, graphical presentation of data, processes for reproducing data. (For B.S.F. and B.Com. students only.)

[0-0-3; 0-0-3]

352. Mechanical Drawing.—Machine drawing; technical sketching; graphical presentation of engineering data in the form of charts, rectilinear, log and semi-log graphs; graphical integration and differentiation. This course commences immediately after the spring examinations and continues for a period of twelve days, eight hours per day.

357. Production Methods.—Processes and machines used in industrial manufacture: foundry practice; pattern-making; welding; hot and cold forming; press work; plastic moulding; machine tools; inspection, measuring instruments and gauges; experience in basic metal-cutting machines. Textbook: Doyle, *Manufacturing Processes and Materials for Engineers*. [1-3*-0; 1-3*-0]

361. Mechanics I.—Kinematic relations with respect to fixed and moving coordinate systems, transformation of coordinates, kinematics and synthesis of machine elements, analytical design of function generators, introduction to computing mechanisms, fundamental laws of mechanics (Newton's law for linear motion, Euler's equation for rotational motion, D'Alembert's Principle, Principle of virtual work, Lagrange's equation, Hamilton's principle), force analysis and balancing of machinery, vibration of machine members, vibration isolation. [1-0-2; 1-0-2]

363. Machine Design I.—Strength of materials applied to machine design; elastic and plastic stress distribution in beams and twisted shafts; curved bars; combined stress and theories of strength; deflection of beams; Castigliano's theorem; statically indeterminate problems; fatigue and stress concentration; properties and selection of materials. Textbooks: Spotts, *Design of Machine Elements*; Marks, *Mechanical Engineers Handbook*. [2-0-2; 2-0-2]

367. Applied Mechanics.—Three dimensional elasticity; theories of failure; experimental stress analysis; introduction to plasticity; residual stress; introduction to rheology; impact; elastic and plastic wave propagation. [2-0-3; 0-0-0]

371. Applied Thermodynamics.—Thermodynamic forms of energy; non-flow and steady-flow systems and equations; gas properties, processes and energy values; thermodynamic cycles and the second law; combustion engine cycles; vapour properties and tables; refrigeration; nozzles and fluid flow; steam and gas turbines. [2-0-0; 2-0-0]

372. Mechanical Testing and Measurement.—Methods of measurement; calibration and use of instruments; tests of machines and principles covered in the fluid mechanics and thermodynamics lecture courses. [0-3-0; 0-3-0]

373. Applied Thermodynamics.—Thermodynamic forms of energy, non-flow and steady-flow systems and equations; gas properties; processes and energy values; thermodynamic cycles and the second law; combustion engine cycles; vapour properties and tables; steam and gas turbines; refrigeration; gas mixtures; gas and vapour mixtures. [2-0-0; 2-0-0]

374. Thermodynamics Laboratory.—Calibration and use of measuring instruments; testing of engines and power plant apparatus. [0-3*-0; 0-3*-0]

376. Mechanical Laboratory.—A laboratory study of the phenomena and devices of mechanical engineering with emphasis on measuring techniques and experimental verification of the results of analysis and numerical computation. [0-3-0; 0-3-0]

381. Fluid Mechanics.—Physical properties of fluids, fluid statics, dynamics of ideal fluids, energy and momentum relations, two-dimensional potential flows, circulation, lift on airfoils, analysis and similitude, turbomachinery, one-dimensional flow of compressible fluids, viscous flows and fluid lubrication, boundary layer theory and flow of viscous fluids in pipes. [2-0-1; 2-0-1]

383. Mechanics and Thermodynamics of Fluids.—Fluid properties; one and two dimensional kinematics; stream functions and velocity potentials; dynamical equations for steady and non-steady flow; classical thermodynamics of fluid systems; dynamic similarity principles; high speed flow, viscous flow; turbulence; boundary layer theory; applications of theory to engineering devices. [3-0-3*; 3-0-3*]

398. Engineering Report.—The subject of the report should be some scientific or engineering work, with which the student is familiar. The report will be judged on the clarity of its exposition, and the orderliness of its arrangement, as well as on material content. One typed copy of the report shall be submitted to the Department not later than October 1.

437. Building Services (Mechanical).—Physics of temperature control of buildings; basic systems of heating and air conditioning; sanitation problems, water supply and distribution in buildings; elevators and other mechanical equipment. (For students in Architecture only.) Textbook: Kinzey and Sharp, *Environmental Technologies in Architecture*. Mr. Slinn. [3-0-0; 0-0-0]

455. Industrial Engineering.—Quality control; statistical methods; control charts; time and motion study; production control; plant layout and material handling. [1-0-3*; 1-0-3*]

463. Machine Design II.—Design of power transmission equipment, shafts, bearing, belt and chain drives, gears and gear trains; design for welding; flat plates; thick cylinders and press fits; torsion; shells and pressure vessels; design of machines and preparation of working drawings. Textbooks: as for M.E. 363. [2-0-3; 2-0-3]

465. Mechanics II.—Review of basic dynamics using vector notation; kinematics and kinetics of rigid body; central force motion and Kepler's laws; introduction to orbital mechanics; gyro dynamics; generalized coordinates; formulation and application of energy theorems; vibration analysis; self-excited oscillations; analogue computers. [2-0-3*; 2-0-3*]

466. Automatic Control.—Process and system characteristics; controller characteristics; the closed loop; transient analysis; frequency response; stability; industrial and scientific applications. [1-0-0; 1-0-0]

471. Process Thermodynamics.—Heat transfer by conduction, convection and radiation; heat exchangers; psychrometry; thermal processes on the psychrometric chart; refrigeration; design of heating and air conditioning systems; industrial drying. [2-0-3*; 2-0-3*]

472. Mechanical Engineering Laboratory.—Experimental work in selected topics in mechanical engineering; each laboratory group is assigned a problem for investigation. [0-3-0; 0-3-0]

475. Thermodynamics and Heat Transfer.—Thermodynamics of combustion; thermodynamics in energy conversion; heat transfer by conduction, convection and radiation; film transfer coefficients; transient heat flow. [3-0-3*; 3-0-3*]

479. Thermal Power.—Analysis of P-v and T-s curves; variable specific heats; cycles of historical interest; cycles and combustion processes in actual engines; gas turbines and variations of Brayton cycle; turbine design; free piston engines and gasifiers; variations of Rankine cycle; power generation and heating loads; steam boiler types and characteristics; feedwater treatment. [2-0-3*; 2-0-3*]

481. Aerodynamics.—The principles upon which modern aerodynamics are based; kinematics and dynamics of ideal fluids; thin airfoils; complex variable

methods; finite wing theory; compressible flow and shock waves; airfoils and wings in compressible flow; elements of laminar and turbulent boundary layer theory; airplane performance and stability; experimental work in the low speed wind tunnel. [3-1*-2*; 3-1*-2*]

491. **Industrial Administration.**—Structure of business enterprise; principles of management; industrial engineering techniques; engineering economic analysis; wage payment methods; management and labour. [2-0-0; 2-0-0]

492. **Engineering Economics.**—Costs, simple and compound interest; retirement of debt; present values; depreciation; economic comparison. Textbook: Grant and Ireson, *Principles of Engineering Economy*, 4th edition. [2-0-0; 0-0-0]

498. **Engineering Report.**—The subject of the report should be some scientific or engineering work, preferably one with which the student is personally familiar. A report based on the student's summer work is recommended. The report will be judged on its English expression and orderliness of arrangement, as well as on material content. One typed copy of the report shall be submitted to the Department not later than October 1.

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites — Graduation in Mechanical Engineering or Engineering Physics.

Course — Includes at least 6 units chosen from graduate courses in the Department, and other approved courses.

Ph.D. degree:

Facilities are provided for research and study in the field of Mechanical Engineering with concentration in the following areas:

- (a) Applied Mechanics.
- (b) Aerodynamics, Aeroelasticity and Space Dynamics.
- (c) Thermodynamics and Heat Transfer.

Students should consult the department for courses to be offered in the 1966-67 session since not all courses will be available.

550. **Special Advanced Courses.**—Special advanced courses may be arranged for a graduate student upon the approval of the Head of the Department. The credit will not be for more than 3 units in any one such course.

560. (3) **Experimental Stress Analysis.**—Review of stress-strain formulations and techniques for solving equations of elasticity, computer and numerical methods, physical methods, brittle lacquer techniques, grid and moiré methods, two dimensional photoelasticity, photoelastic coatings, three dimensional methods, point-wise strain and displacement measurement techniques, rosette calculations, recording instruments. Laboratory (limited). Textbook, J. W. Dally and W. F. Riley, *Experimental Stress Analysis*, McGraw-Hill, April, 1965.

561. (3) **Applied Elasticity.**—Analysis of stress and strain in three dimensions; plane stress and plane strain; photoelasticity; torsion; energy methods of stress analysis; bending and buckling of rods; bending of plates; stresses in thin shells. Textbook: Wang, *Applied Elasticity*.

562. (1) **Introduction to Continuum Mechanics.**—Cartesian tensors, transformation and invariants of stress and strain, equations of motion and

equilibrium, boundary conditions, constitutive equations for elastic, viscous and viscoelastic substances, plastic yield conditions and associated flow rules.

563. (2) Lubrication.—Physical properties of lubricants; basic hydrodynamic theory applicable to lubrication problems; plane sliding bearings; journal bearings subjected to steady and dynamic loads; theory of rolling bearings; boundary lubrication; mechanism of metallic friction; the nature of metallic wear.

564. (3) Space Dynamics I.—Dynamics of systems with variable mass; introduction to relativistic mechanics; rectilinear motion of a rocket; ascent to the moon; orbital mechanics; transfer of orbit; estimation of life time; gyroynamics; theory of stabilized platforms; inertial guidance; performance and stability of space vehicles.

565. (2) Advanced Mechanical Vibrations.—Close and far coupled multiple degree of freedom systems, matrix methods, energy methods, vibration of beams, membranes and plates.

566. (2) Dynamics of Automatic Control.—Linear servo-systems; transient and steady state behaviours; frequency response; the root locus method; lag correction and stabilization; multiple loop systems; synthesis; non-linear control.

567. (1) Engineering Rheology.—Rheological kinematics and dynamics; the basic equations of elasticity; the Pascalian liquid; the Hookean solid; the Newtonian liquid; Navier-Stokes equations; viscosity; the Maxwell Liquid; creep; the Kelvin body; macro and micro-rheology; plastic flow; the St. Venant body; the Mises-Hencky flow condition; the Bingham body and generalized bodies.

568. (1) Theory of Plasticity.—Selected problems in the theory of plasticity, thick walled cylinders and spheres, torsion, slip-line fields, indentation, drawing and extrusion. Prerequisite: M.E. 562.

569. (2) Non-Linear Vibration.—Phase plane representation, singular points, exact solutions, equivalent linearization, perturbation method, averaging method, variation of parameters, forced vibration, self-excited vibration.

570. (3) Space Dynamics II.—Dynamics of single and multistage rocket, optimization of rocket performance, geometry or spatial orbit, orbit determination using Gauss, Laplace, and Gibbs method, orbit perturbations and Hansen's method, optimum orbital transfer and rendezvous, active and passive stabilization of space vehicle, introduction to three body problem.

572. (3) Convection Heat Transfer.—Governing equations for laminar and turbulent flow. Forced convection in internal and external flow. Free and combined free and forced convection. Heat transfer at high velocities, in rarefied gases and in two-phase flow. Heat exchangers. Mass transfer.

573. (1½) Radiation Heat Transfer.—Monochromatic and goniometric surface properties. Energy exchange of grey, non-grey, diffuse, directional or specular surfaces. Absorption coefficient and radiation intensity in gas radiation. Radiation between a gas and its enclosure. Radiation of luminous flames.

574. (1½) Conduction Heat Transfer.—Two and three dimensional steady and unsteady heat transfer. Analytical methods. Relaxation, graphical and analogue methods. Conduction with heat sources and sinks. Heat transfer with variable thermal conductivity. Contact resistance. Moving boundaries.

Extended surfaces, their applications and optimization. Experimental methods for determination of thermal conductivity of solids, liquids, and gases.

575. (3) **Advanced Topics in Momentum, Heat and Mass Transfer.**—Special topics in laminar boundary layer theory; arbitrary wall flux. The method of Lighthill; free convection; non-zero wall velocity. Asymptotic expansion—inner and outer solutions. Jets and wakes. Condensation with non-zero interfacial shear. Boiling. Non-Newtonian boundary layer theory; examples.

581. (3) **Theory of Ideal Fluids.**—Topics selected from the kinematics and dynamics of inviscid incompressible fluids in steady and non-steady motion; two-dimensional and axisymmetric potential flows; applications of conformal mapping; Stokes stream function; free streamline flows; vortex motions; non-steady airfoil theory.

582. (3) **Theory of Real Fluids.**—Navier-Stokes equations and exact solutions; boundary layer equations and exact and approximate methods for laminar flow; three-dimensional and non-steady cases; compressible laminar boundary layers; stability of laminar flow and transition; momentum and energy equations for turbulent shear flow; velocity defect law; experimental techniques; free shear turbulent flows; boundary layer control. Text: Schlichting, *Boundary Layer Theory*.

583. (3) **High Speed Gas Dynamics.**—Topics selected from the dynamics of a gas considered mainly as a non-heat-conducting inviscid continuum; acoustic small-disturbance equations; initial and boundary value problems of wave propagation; applications to airfoils and wings at high speed; conical flow; slender body theory; characteristics theory; hodograph methods; shock and blast waves; similarity methods; hypersonic flow theory.

584. (2) **Mechanics of Rarefied Gases.**—The flow of a rarefied gas in terms of kinetic theory. A review of classical statistical mechanics. Free molecule flow. The Boltzmann equation applied to non-equilibrium flows.

585. (3) **Aeroelasticity.**—Idealization of elastic systems; elastic axis; influence coefficients; coupled and uncoupled modes of vibration; unsteady aerodynamics; static aeroelastic phenomena; two dimensional and three dimensional flutter theory; solution of flutter stability determinant; buffeting and stall flutter; aspect ratio and compressibility effects; flutter model and testing technique.

598. (1) **Seminar.**—Presentation and discussion of current topics in mechanical engineering research.

599. **Thesis.**—For M.A.Sc. degree.

699. **Thesis.**—For Ph.D. degree.

Metallurgy

350. **Metallurgical Thermodynamics I.**—Thermodynamic basis of metallurgical processes; phase rule, heat of reaction, free energy, activity, thermodynamic equilibria. [0-0-0; 2-0-0]

351. **Laboratory Methods.**—Application of chemical principles in pyrometallurgical and hydrometallurgical procedures. [0-3*-0; 0-3*-0]

352. **Process Metallurgy I.**—Introduction to metallurgy, application of chemical principles in unit processes employed in metallurgical operations; technology of base metal production. [2-0-0; 2-0-0]

353. **Metallurgical Calculations I.**—Stoichiometry, heat and material balances in metallurgical processes; problems in physical metallurgy. [0-0-2; 0-0-2]

355. **Laboratory Methods and Problems.**—Metallurgy laboratory and problems for students in Fourth Year Mining Engineering. [0-3*-2*; 0-3*-2*]

370. **Structure of Metals I.**—Crystallography; X-rays and X-ray diffraction; imperfection; deformation behaviour; alloy theory; phase transformations; properties of metals and alloys. Textbook: Cullity, *Elements of X-Ray Diffraction*. [2-0-0; 2-0-0]

371. **Physical Metallurgy Laboratory I.**—Metallographic technique; photography and analysis of microstructures of ferrous and non-ferrous alloys; studies of heat treatment; X-ray diffraction; deformation behaviour. [0-3*-0; 0-3*-0]

372. **Physical Metallurgy.**—Alloying of metals; structures, heat treatment and fabrication of ferrous materials. [1-0-0; 1-0-0]

374. **Physical Metallurgy I.**—A lecture and laboratory course primarily for students in the Third Year of Engineering Physics. Crystallography; X-ray diffraction; crystal imperfections and deformation behaviour; alloy theory; diffusion and phase transformations; properties of metals and alloys. [2-3*-0; 2-3*-0]

376. **Physical Metallurgy.**—Structure of metals; deformation processes; alloying theory; principles of heat-treatment; metal fabrication; properties and selection of ferrous and non-ferrous alloys; corrosion; nuclear metallurgy. Reference: Dieter, *Mechanical Metallurgy*. [2-0-0; 2-0-0]

377. **Physical Metallurgy Laboratory.**—Metallographic techniques; observations of metal and alloy structures; experiments illustrating heat-treatment of steel, deformation and annealing of metals. [0-2*-0; 0-2*-0]

382. **Non-Metallic Materials I.**—Constitution, structure, properties and applications of non-metallic solids; ceramics; oxides and silicate systems; glasses; refractories; electronic materials; organic polymers. [0-0-0; 2-3-0]

390. **Seminar I.**—Training and practice in public speaking and presentation of technical papers. [0-0-1; 0-0-1]

398. **Engineering Report.**—See page C20.

450. **Metallurgical Thermodynamics II.**—Thermodynamic equilibria in metal chemistry; phase rule applications; gas-solid, slag-metal, electrolytic, and electrode reactions. Introduction to metallurgical kinetics: reaction order, rate and diffusion control. [2-0-0; 2-0-0]

451. **Metallurgy Laboratory.**—Experiments and problems illustrating the principles and practice of extractive metallurgy. [0-3*-0; 0-3*-0]

452. **Process Metallurgy II.**—Application of chemical principles in unit processes employed in the production of metals. Economic and engineering aspects of process selection and plant operation. References: A.I.M.E., *Basic Open Hearth Steelmaking*, 2nd edition; Liddell, *Handbook of Non-Ferrous Metallurgy*, 2nd edition; Hampel, *Rare Metals Handbook*. [2-0-0; 2-0-0]

453. **Metallurgical Calculations II.**—Problems on material and heat balances in metallurgical unit processes; plant design and quality control; problems in physical metallurgy. Textbook: Butts, *Metallurgical Problems*. [0-0-3; 0-0-3]

455. **Research Project.**—Study of a selected problem in extractive or physical metallurgy, or ceramics, or mineral dressing. [0-6-0; 0-6-0]

456. **Hydrometallurgy and Kinetics.**—Electrode potentials; pH-potential diagrams; equilibria in aqueous solutions; theory of rate processes; corrosion; metal oxidation. [1-0-0; 1-0-0]

458. **Physical Chemistry of Metal Surfaces.**—Thermodynamics of surfaces and interfaces; wetting and contact angles; adhesion and bonding. [1-0-0; 1-0-0]

460. **Structure of Metal Compounds.**—Ionic and covalent bonding; crystal field theory complex ion formation; inorganic crystal structures. [1-0-0; 1-0-0]

462. **Thermodynamics of Metal Systems.**—Phase rule and its applications to metal systems; thermochemistry of metals and alloys; irreversible thermodynamics. [2-0-0; 2-0-0]

470. **Structure of Metals II.**—Diffusion in Solids; nucleation and growth reactions, diffusionless transformations applications of X-ray diffraction to Physical Metallurgy; dislocation theory; plastic deformation. [2-0-0; 2-0-0]

471. **Physical Metallurgy Laboratory II.**—Electron microscopy; zone-refining; X-ray diffraction; dilatometry; other physical metallurgical techniques. [0-3*-0; 0-3*-0]

472. **Physical Metallurgy II.**—Lectures and laboratory exercises, primarily for students in the Fourth Year of Engineering Physics. Diffusion in solids; nucleation and growth reactions; diffusionless transformations; applications of X-ray diffraction to physical metallurgy; dislocation theory; plastic deformation and recovery mechanisms. [2-3*-0; 2-3*-0]

474. **Metal Fabrication I.**—Mechanical and metallurgical principles of primary and secondary metal fabricating processes including casting, welding, powder metallurgy, and a variety of forming methods; residual stresses. References: Flinn, *Fundamentals of Metal Casting*; Udin et al, *Welding for Engineers*; Dieter, *Mechanical Metallurgy*; Jones, *Powder Metallurgy*. [2-0-0; 2-0-0]

478. **Electron Theory.**—Applications of free electron theory and band theory of solids to alloying, thermoelectricity, semiconductors, magnetic materials and to dielectrics. [1-0-0; 1-0-0]

482. **Non-Metallic Materials II.**—Microstructure—phase distribution in Non-Metallics. Properties of composites such as thermal expansion, thermal stress, thermal conductivity etc. and semiconductivity of oxides. [1-0-0; 1-0-0]

490. **Seminar II.**—Weekly seminar for discussion of current technical topics; written report on production methods and economic aspects of one of the metals. [0-0-1; 0-0-1]

498. **Engineering Report.**—A comprehensive report based on the student's summer work. Emphasis will be placed on English expression, as well as on the arrangement and accuracy of the material, and on the analytic interpretation of data rather than on description. Draft copy to be handed to the Head of the Department not later than October 1; final typed copy to be handed in on the first day of the second term.

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites—Graduation in Metallurgical, Chemical, Mechanical Engineering or Engineering Physics.

Course—Includes at least 3 units from courses numbered 500 in Metallurgy, and other approved courses.

M.Sc. Degree:

Prerequisites—Honours in Physics, Chemistry, or equivalent.

Course—At least 3 units from courses numbered 500 in Metallurgy, and other courses recommended or approved.

Ph.D. Degree:

Department provides facilities for research studies in:

Hydrometallurgy: pressure oxidation and reduction reactions, electrode processes, corrosion.

Pyrometallurgy: thermodynamic and ionic equilibria in slags and fused salts, slag-metal equilibria and thermodynamic properties of metal solutions.

Physical Metallurgy: deformation of single crystals, dislocation mechanics, diffusion and transformations, electron microscopy.

Mechanical Metallurgy: properties of refractory metals, dispersion hardening, composite structures, fine particle strengthening.

Ceramics: creep in refractory oxides, metal ceramic systems, solid state transitions.

550. (2) **Metallurgical Thermodynamics.**—Application of advanced thermodynamic principles in metallurgical processes. Mr. Samis.

552. (1) **Metallurgical Kinetics.**—Application of chemical reaction rate theory to metallurgical processes. Mr. Peters.

554. (1) **Hydrometallurgy.**—Modern theories of comminution, leaching, purification and precipitation processes. Staff.

560. (1) **Metallurgy of the Rarer Metals.**—Principles, practices, and research trends in the extractive metallurgy of rarer metals. Mr. Peters.

561. (1) **Nuclear Metallurgy.**—Survey of principles of reactor operation; metallurgical aspects of fuels, constructional materials, radiation damage, corrosion. Mr. Armstrong.

570. (2) **Structure of Metals III.**—Nature and properties of lattice imperfections; dislocation theory and its use to describe work hardening, creep, structure of grain boundaries and other phenomena. Mr. Teghtsoonian.

572. (2) **Advanced Physical Metallurgy.**—Solidification and crystal growth; zone refining; nucleation theory; eutectoid decomposition; age hardening; recrystallization and grain growth; martensitic transformations; order-disorder transformations. Staff.

574. (1) **Topics in Physical Metallurgy.**—Topics of metallurgical interest in the field of physical metallurgy to be selected for discussion. Staff.

576. (1) **Diffusion I.**—Mathematical analysis; Kirkendall effect; mechanisms; theories of self-diffusion and chemical diffusion; grain-boundary and surface effects; theory of sintering. Mr. Brown.

580. (1) **Metal Fabrication II.**—Current research and analysis of metal fabricating processes such as casting, metal forming, and powder metallurgy. Mr. Lund.

581. (1) **Sintering Theory.**—Driving force for sintering; theory of sintering in the solid state, and in the presence of a liquid phase; current theory of hot pressing and reactive hot pressing. Mr. Chaklader.

582. (1) **Advanced Ceramics.**—Complex silicate structures; ion exchange in silicates; kinetics of solid state reactions; kinetics of high temperature processes. Mr. Chaklader.

584. (1) **Advanced X-Ray Diffraction.**—Reciprocal lattice; dislocations and stacking faults; Fourier analysis; microbeam analysis; small angle scattering; applications in physical problems. Mr. Teghtsoonian.

586. (1) **Electron Microscopy.**—A basic course on the theory and practice of electron microscopy with emphasis on transmission microscopy. Mr. Tromans.

588. (2) **Physical Metallurgy.**—Topics covered will include dislocation theory, diffusion, solidification, nucleation theory and structure of liquids. Staff.

592. (1-3) **Special Topics in Metallurgy.**—A special advanced course may be arranged on approval of the Head of the Department.

598. **Research Conference.**—A required course for all graduate students in Metallurgy or Metallurgical Engineering, in which current research projects will be discussed. The course carries no academic credit.

599. (6) **Thesis.**—For M.A.Sc. and M.Sc. Degrees—Research studies in chemical metallurgy, physical metallurgy, or ceramics.

699. **Thesis.**—For Ph.D. degree.

Microbiology

200. (3) **Introductory Microbiology.**—History of bacteriology; bacteria in nature; classification of bacterial forms; methods of culture and isolation; relation of bacteria to agriculture, industry, veterinary science, public health and sanitation. Prerequisite: Chemistry 110, or 101 or 102 and Biology 101 or the equivalent. [3-2-0; 3-2-0]

Mineral Engineering

250. **Introduction to Mineral Engineering.**—The nature and scope of mineral engineering; introductory rock mechanics. [1-0-0; 0-0-2]

260. **Mineral Engineering Problems.**—The application of mathematics, particularly differential equations, to the formulation of, and the solution of, physical problems encountered in engineering. These include problems in structural analysis, electrical circuitry, vibrational analysis, elasticity, flow and plasticity, optics, etc. [0-0-2; 0-0-2]

350. **Mineral Exploration.**—Principles underlying the search for and exploration of mineral deposits; introduction to sampling and valuation of mineral deposits. [1-0-0; 1-0-0]

351. **Mineral Exploration and Valuation.**—Introduction to economic geology, geological principles of mineral exploration, sampling and valuation of mineral deposits. [2-0-2; 2-0-2]

352. **Environmental Control.**—Control of occupational health hazards, mine ventilation and air conditioning. [0-0-3; 0-0-0]

353. **Methods Studies.**—Basic principles involved in the design and operation of mining systems, and methods for accumulating and analyzing data

required for design. The course will include an introduction to the techniques of rock mechanics and will make use of mathematical models, and statistical methods. [0-0-0; 2-0-0]

370. Mineral Dressing I.—Principles; testing procedure; sampling; crushing; screening; grinding; classification; gravity concentration; flotation; cyanidation; magnetic separation; milling calculations. Textbook: Richards and Locke: *Textbook of Ore Dressing*. [2-2-0; 2-2-0]

371. Principles of Mineral Dressing.—Economic principles and unit operations involved in the comminution and concentration or beneficiation of mineral raw materials to produce an economically marketable product. [1-3*-0; 1-3*-0]

390. Seminar.—Oral presentation of topics by students before the class. [0-0-1; 0-0-1]

398. Engineering Report.—A comprehensive report based on the student's summer work. Emphasis will be placed on English expression, as well as on the arrangement and accuracy of material; also on the analytical interpretation of data rather than on description. Draft copy to be handed to the Head of the Department not later than October 15; one final typed copy to be handed in on the first day of the second term.

452. Valuation.—Valuation of mineral property—reliability of ore reserve estimates, mineral economics, capital budgeting decision criteria. [3-0-0; 0-0-0]

453. Systems Analysis.—The design of experiments to produce data; the use of statistics, probability theory and other techniques of operations research together with studies of the constraints imposed by financial, technical, physical and human considerations to design, to analyse, and to establish systems and sub-systems for operations in the mineral industry. [0-0-0; 3-0-0]

454. Problems.—Problems in mine plant design; discussion of current technical literature; mine and plant visits. Reference: Staley, *Mine Plant Design*. [0-0-0; 0-0-2]

455. Metrology.—Theory and techniques of measurement, with emphasis on the measurement of physical properties useful in engineering design in granular media: acoustic, strain, temperature, vibration and other measurements. [2-0-0; 2-0-0]

456. Rock Mechanics.—Theories of rock mechanics and their application to the rational design of rock structures, to mine design, and to open pit design. [2-0-0; 2-0-0]

457. Introduction to Rock Mechanics.—Theory of elasticity, rheology, physical properties and behaviour of rocks, strain distribution in rock structures, instrumentation and measurement techniques. [2-1-0; 2-1-0]

460. Advanced Engineering Problems.—The application of the mathematics, sciences, and special techniques covered in undergraduate courses to problems such as the design of rock structures, design of mining systems, design of mineral dressing plants, problems in operations research, valuation, environmental control. [0-0-3; 0-0-3]

470. Mineral Dressing II.—(Continuation of Min. Eng. 370.) Flowsheets; mill location and design, smelter contracts; metallurgical calculations; non-metallics; coal preparation; plant control. Text-book: Taggart, *Elements of Ore Dressing*. References: Richard and Locke, *Text-book of Ore Dressing*; Taggart, *Handbook of Mineral Dressing*; Gaudin, *Principles of Mineral Dressing*; current periodicals. [2-3-0; 2-3-0]

471. **Surface Properties.**—Surfactants and their properties; electrical effects at solid/liquid interfaces; energetics of adsorption, adhesion, wetting; utilization of surface properties in mineral engineering; flotation, and corrosion prevention. [2-0-0; 2-0-0]

480. **Research or Design Project.**—Research or design under the direction of a staff member, and preparation of thesis and/or reports based on the work done. [0-3-0; 0-6-0]

490. **Seminar.**—Oral presentation of topics by students before the class. [0-0-1; 0-0-1]

498. **Engineering Report.**—A comprehensive report, based on the student's summer work. Emphasis will be placed on English expression, as well as on the arrangement and accuracy of the material; also on the analytic interpretation of data rather than on description. Draft copy to be handed in to the Head of the Department not later than October 1; final typed copy to be handed in on the first day of the second term.

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites—Graduation in Mineral or Geological Engineering.

Course—Includes at least 3 units chosen from graduate courses in the Department of Mineral Engineering, and other approved courses.

Ph.D. Degree:

The Department provides facilities for research studies in the following fields:

- (a) Rock mechanics.
- (b) Mining systems and operations research.
- (c) Mineral dressing.

550. (1) **Mining Methods.**—A more advanced study of some aspects of mining methods. Mr. Crouch.

551. (2) **Rock Mechanics.**—Rheology and its mathematical development, testing rocks in the laboratory, testing rocks in situ, mine and excavation geometry, design of rock structures, special supports. Mr. Emery.

552. (2) **Applied Physical Measurements.**—Theory of elasticity, measurement theory and data analysis, measurement techniques and their application in experimental situations. Photoelastic, strain gauge, hydraulic, sonic devices; gravimetric, magnetic, temperature and other measurements. Mr. Emery.

553. (2) **Operations Research.**—Production engineering, linear programming, queuing theory and applications, simulation, reliability theory, game theory, dynamic programming. Mr. Emery.

570. (2) **Theory of Fine Particles.**—Measurement of particle size and surface area; physical and chemical behaviour of fine particles; methods of separation; settling; filtration; use of electrolytes; effect of slime coatings. Reference: Dalla Valle, *Micrometrics*, 2nd edition. Mr. Howard.

571. (2) **Properties of Interfaces.**—Physical and chemical adsorption at various interfaces; thermodynamic models of adsorption isotherms; surfactants, insoluble monolayers, interactions at interfaces and synergistic effects; electrical effects at interfaces. Applications: flotation, corrosion, emulsification, detergency, lubrication. Mr. Leja.

590. (1-3) **Special Advanced Topics.**—A special advanced course may be arranged upon the approval of the Head of the Department.

598. (1) **Seminar.**—Presentation and discussion of current topics in mineral engineering research. Attendance of all students proceeding to graduate degrees in the Department is required during each year of residence.

599. **Thesis.**—For M.A.Sc. degree. Research studies in mining or mineral dressing.

699. **Thesis.**—For Ph.D. Degree.

Physics

155. **Mechanics.**—The principles of statics and dynamics; work and energy, impulse and momentum for linear and curvilinear motion; virtual work, friction; gravitational systems and elementary orbital motion. Textbook: Halliday and Resnick, *Physics for Students of Science and Engineering*. [2-0-4; 2-0-4]

156. **Heat, Light and Sound.**—The thermal properties of matter; gas laws; the first and second laws of thermodynamics; applications. Radiation laws; simple harmonic motion; waves, sound, geometrical and physical optics. Textbooks: Halliday and Resnick, *Physics for Students of Science and Engineering*; Yarwood and Castle, *Physical and Mathematical Tables*. [2-3*-0; 2-3*-0]

250. **Electricity and Magnetism.**—Quantitative study of basic principles; introduction to alternating currents. [2-3-0; 2-3-0]

251. **Electric and Magnetic Fields.**—Classical electric and magnetic fields, with emphasis on both microscopic and macroscopic properties leading up to Maxwell's equations and electromagnetic waves. Primarily for students intending to proceed to Electrical Engineering, who are taking E.E. 251 concurrently. Textbook: Halliday and Resnick, *Physics for Students of Science and Engineering*. [2-3*-0; 2-3*-0]

Primarily for Engineering Physics Students

351. **Electricity and Magnetism.**—Classical electricity and magnetism leading up to Maxwell's equations and some of their applications. Textbook: Reitz and Milford, *Foundations of Electromagnetic Theory*. [2-0-0; 2-0-0]

352. **Introduction to Mathematical Physics.**—Applications of differential equations and elementary vector analysis to some physical problems with emphasis on the mathematical formulation of the physical problem and on the physical discussion of the solution. [2-0-0; 2-0-0]

358. **Physical Optics.**—Geometrical and physical optics; optical instruments, interference, diffraction, polarization, spectroscopy. [2-3-0; 2-3-0]

398. **Essay.**—See page C20.

405. **Elasticity.**—Introductory theory of elasticity with some applications. [2-0-0; 0-0-0]

409. **Experimental Physics.**—Advanced experiments in electricity, electronics, atomic and nuclear physics. Textbooks: Hoag, *Electron and Nuclear Physics*; Strong, *Procedures in Experimental Physics*; Yarwood, *High Vacuum Technique*. [0-6-0; 0-6-0]

452. Atomic and Nuclear Physics.—A quantitative study of atomic, molecular and nuclear properties of matter. Quantum aspects of radiation and wave nature of matter. [3-0-0; 3-0-0]

455. Thermodynamics and Statistical Mechanics.—Laws of thermodynamics and statistical mechanics; applications to modern physics and some problems of engineering interest. [3-0-0; 3-0-0]

456. Classical Mechanics.—Analytical mechanics of particles and rigid bodies. [2-0-0; 2-0-0]

458. Fluid Mechanics.—Fluid flow, the equations of motion and their solution for nonviscous and viscous fluids, laminar and turbulent flow, stability, rheology. [0-0-0; 2-0-0]

480. Seminar.—Training in the oral presentation of scientific papers by the student. [0-0-1; 0-0-1]

For Other Students

315. Thermodynamics and Statistical Theory of Matter.—Laws of thermodynamics and an introduction to statistical mechanics. [3-0-0; 3-0-0]

372. Introductory Atomic Physics.—Experimental evidence for the quantum theory of radiation; the hydrogen atom, elementary spectra, electron spin, X-rays, band theory of crystals and nuclear radioactivity. Textbook: Sproull, *Modern Physics*. Primarily for metallurgical students. [2-0-0; 2-0-0]

472. Modern Physics.—A course primarily for students of electrical engineering on the fundamental concepts underlying modern physics. [2-0-0; 2-0-0]

Courses for Graduate Students

M.A.Sc. Degree:

Prerequisites—Graduation in Engineering Physics or Electrical Engineering.

Course—Includes Thesis counting at least 3 units, at least 6 units chosen from graduate courses in the Department of Physics, and other approved courses.

599. Thesis.—For M.A.Sc. degree.

For descriptions of other courses in Physics, see the Faculty of Science calendar.


Plant Science

321. Biometrics.—Elementary principles of the analysis, presentation and interpretation of biological data. Text: Li, *Statistical Inference*, Vol. I. Prerequisite: First Year Mathematics. [3-2-0; 0-0-0]

344. Physiology of Crops.—Plant metabolism, including enzymes, photosynthesis, respiration, growth regulation, plant-water relationships, translocation, mineral nutrition. Various aspects of plant growth including influence of environmental factors. Textbook: Meyer, Anderson and Bohning, *Introduction to Plant Physiology*. Prerequisite: Biology 101. [2-2-0; 2-2-0]

Soil Science

313. Soil Physics.—The physical properties of soils and their measurement. Prerequisite: Physics 101 or 110. [2-2-0; 0-0-0]



**SCHOOL
OF
ARCHITECTURE**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The School of Architecture calendar, 1966-67

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Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

HENRY ELDER, M.B.E., F.R.I.B.A., M.R.A.I.C., F.I.I.A.L., Professor and Director of the School.

WOLFGANG GERSON, A.A. Dipl., F.R.A.I.C., A.R.I.B.A., Professor.

B. PAUL WISNICKI, Dipl. Eng. (Lwow, Poland), P.Eng., M.E.I.C., Professor of Structures.

ARTHUR C. ERICKSON, B.Arch. (McGill), M.R.A.I.C., Associate Professor.

ABRAHAM ROGATNICK, B.A., B.Arch. (Harvard), M.R.A.I.C., Associate Professor.

ROBIN P. A. CLARKE, A.A. Dipl., M.Arch. (Harvard), A.R.I.B.A., M.R.A.I.C., Assistant Professor.

CHARLES A. TIERS, B.Arch. (Brit. Col.), M.Arch. (M.I.T.), M.R.A.I.C., Assistant Professor.

BRUNO FRESCHI, B.Arch. (Brit. Col.), M.R.A.I.C., Part-time Lecturer.

KENNETH G. TERRISS, B.Arch. (Brit. Col.), M.Arch. (M.I.T.), M.R.A.I.C., Part-time Lecturer.

RONALD B. WALKEY, B.Arch. (Brit. Col.), Part-time Lecturer.

CATHERINE WISNICKI, B.Arch. (McGill), M.R.A.I.C., Part-time Lecturer.

WOODRUFF W. WOOD, B.Arch. (Oregon), M.R.A.I.C., Part-time Lecturer.

J. DOUGLAS, B.A.Sc. (Brit. Col.), Sen.Mem.I.E.E.E., Senior Lecturer, Electrical Engineering, Honorary Lecturer.

H. PETER OBERLANDER, B.Arch. (McGill), M.C.P., Ph.D. (Harvard), A.R.I.B.A., A.M.T.P.I., M.R.A.I.C., Professor of Planning and Design, Honorary Lecturer.

STEPHEN P. SLINN, P.Eng., Honorary Lecturer.

L. A. J. THOMAS, A.R.C.A., Department of Fine Arts, Honorary Lecturer.

PHILIP H. WHITE, M.Sc. (Est. Man.) (London), F.R.I.C.S., Professor of Estate Management, Honorary Lecturer.

Visiting Lecturers

DAVID HICKMAN, R. M. IREDALE, RONALD S. NAIRNE, JOHN LANZIUS, SIM VAN DER RYN, MURRAY POLSON, C. HERBERT WHEELER, L. A. WILLIAMS, W. T. LANE, A. SOKOL.

THE SCHOOL OF ARCHITECTURE

The architectural course at the University of British Columbia is of three years duration and follows a sound academic background in the Liberal Arts or in the Sciences. Emphasis is given in the architectural course to the integration of the arts and sciences as a means of stimulating the creative genius of the architect. Admission to the School of Architecture is dependent upon the presentation of evidence of the successful completion of at least three years of study in the Faculty of Arts or in the Faculty of Science at this University, or the equivalent in other approved universities.

The first degree to be granted upon a satisfactory record of both academic and practical achievement in the field is that of Bachelor of Architecture (B.Arch.—the hood is scarlet with white cord). It is hoped that the very nature of the study will encourage and prepare students for the pursuit of learning at higher and related levels; for example: Urban and Regional Planning, Landscape Architecture, and Industrial Design. In some cases students may undertake research into problems directly concerned with architecture in the related subjects of liberal arts or applied science, or problems of concern to practical building. The University of British Columbia provides facilities for many of these higher forms of learning under the direction of the Faculty of Graduate Studies, and reference should be made to the appropriate publication for detailed information.

Admission

Application for admission to the School of Architecture as a candidate for the B.Arch. degree must be made through the Registrar prior to August 1. Students from universities other than the University of British Columbia must submit with their application for admission complete and authoritative evidence in duplicate of the academic standards achieved.

The restricted size of the School and the tutorial method of teaching employed make severe demands upon the students selected for admission. Consequently only those showing promise in the field of architecture will be considered. It is advisable that all students contemplating architecture as a career arrange an interview with the Director in order that the requirements of the School be properly understood. Students living outside the area of convenient travel must supply the Director with detailed information of all related interests and accomplishments together with examples of sketches or drawings prepared in the more recent past.

Students are urged to establish an early contact during their pre-Architecture years so as to become better acquainted with the School and its programme and to participate in its extra-curricular activities.

A student concerned primarily in entering the field of architecture is advised to follow carefully a choice of elective subjects to enlarge his understanding of man and his physical world on the one hand, and his appreciation of fine art on the other. The ability to draw effortlessly and convincingly is considered of prime importance in the education of the architect and a course is offered by the Department of Extension at the University towards this end and under the classification of Drawing and Painting Workshop.

The Registrar is concerned with the academic standards achieved prior to entry into the School. The following minimum requirements will be demanded:

1. (a) Completion of three years of the course leading to a degree in the Arts or Sciences in the University of British Columbia providing:

- (i) an average of at least 65% has been obtained in the examinations of the Third Year in a full course;
or
 - (ii) an average of at least 65% has been obtained in the combined results of the examinations in the Second and Third Years of a full course,
or
 - (b) Graduation in an approved course of studies at the University of British Columbia or at another approved university, with a graduation standing of at least 60%.
 - (c) Satisfactory completion of at least two years of a five-year course in architecture at another approved university.
2. Successful completion of the following subjects at this University or their equivalent at another approved university:

English 100, Literature and Composition	Fine Arts 228, Design Fundamentals
English 200, Literature and Composition	Physics 101, Elementary Physics or 110, Mechanics, Electricity and Atomic Structure
Math. 120, Fundamental Mathematics	Physics 200, Intermediate Physics
Math. 202 Calculus	Physics 326, Electricity, Acoustics and Light, or Physics 300, Electricity and Magnetism or 308, Physical Optics
Fine Arts 125, History of Art or Arch. 305, History of Architecture*	

*Credit will not be given for both F.A. 125 and Arch. 305.

Two years of a language other than English are required for a B.A. degree.

It should be noted that the requirements for admission into the architectural programme are different from those forming the basis of a B.A. or B.Sc. degree and students wishing to obtain such a degree should follow closely the requirements stated in the respective Calendars.

Candidates who do not meet the above admission requirements

- (a) in terms of the required average

or

- (b) in terms of the specified prerequisite courses or who hold degrees other than a B.A. or a B.Sc.

and who wish to be considered for admission, should apply in writing to the Registrar requesting that their cases be reviewed by the Committee on Admissions.

Advanced Standing

Students who have attended other Schools of Architecture or universities may be granted credit for work undertaken in which a second class or higher standing has been obtained.

General University Regulations

General University regulations concerning discipline, health and other matters as detailed in the General Information bulletin are applicable to students in the School of Architecture.

Attendance and Examinations

A student who fails to comply with the regulations regarding attendance at lectures and studios, except for reasons deemed satisfactory by the School, may be required either to repeat the work of the year or to withdraw from

the School. Normally, examinations will be held at the close of each session in April. Term examinations and some final examinations will be held prior to the Christmas vacation or as noted elsewhere in this Calendar in connection with specific courses.

To pass his Year, a student must obtain an average mark of not less than 60% in the work of that year. However, if he has an average of over 60% and has failed not more than two subjects, he will be allowed to write supplementals, with the exception of Architectural Design. A student failing in Design must repeat the Year. Any subject in which he obtains less than 50% in either the examination or in the laboratory or studio work is considered a failure. The School may direct such work as will be necessary to prepare for the supplemental examination or to pass the laboratory or studio work.

Term essays and examination papers may be refused a passing mark if they are illegible or noticeably deficient in English.

A student who in any year does not meet the above requirements may be required either to repeat the work of the year or to withdraw from the School. At no time will a student be permitted to repeat a year more than once nor will he be granted the privilege of repeating more than three units from a previous year. No student may enter the Third (final) year without a clear standing.

Successful candidates will be graded as follows: First Class, an average of 80% or over; Second Class, 65% to 79%; Passed, 60% to 64%. Honours standing will be granted to a student who has obtained an over-all average of 80% or over in the Final Year and 75% or over during the two previous years with no subject below 50%.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings, where permitted, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper, which sum will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less.

Supplemental Examinations

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent upon completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.00.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". Upon graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of Christmas or mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Fees—Subject to change without notice

First Term Fees, \$290 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$551 at time of registration. Third Year students will be assessed an additional \$7 to cover the graduating fee.

Second Term Fees, \$261, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Practical Experience

The award of the B.Arch degree is contingent upon certain outside experience. The student is expected to spend 12 weeks working in an architect's office and a further 12 weeks on actual construction work. Bona fide evidence of this experience is to be filed with the Director. The School will advise the student whenever possible on both practice and site experience in order that his time be most usefully employed.

Professional Associations

Provincial regulations governing professional registration vary slightly across Canada, but all accept university graduation as a preliminary qualification. In order to practise as a Registered Architect in the Province of British Columbia, the graduate must present himself to the Architectural Institute of British Columbia for examination after spending two years under professional direction subsequent to his graduation. Members of the A.I.B.C. automatically become Members of the Royal Architectural Institute of Canada. So that an early professional contact can be established, students may make application to the A.I.B.C. for membership as Undergraduate Associates.

Anticipated Expenses Involved

Apart from the cost of living and tuition during the course of training, certain commitments for books, materials and travel should be anticipated. It is never possible to give precise estimates of these essential costs but the following figures may act as a guide:

First Year, approximately \$300 (including field trip)

Second Year, approximately \$300 (including field trip)

Third Year, approximately \$400 (including field trip)

BACHELOR'S DEGREE PROGRAMME

First Year

Subject	First Term		Second Term	
	Lect.	Lab. or Studio	Lect.	Lab. or Studio
Arch. 400—Arch. Design I.....	1	15	1	16
Arch. 402—Elements of Architecture.....	3	3	....	....
Arch. 405—Architectural History*†.....	3	....	3	....
Arch. 406—Architectural Workshop I.....	2 weeks before start of lectures			
Arch. 411—Building Principles and Practice.....	3	4	3	8
Ap. Sc. 270—Strength of Materials.....	2	3**	2	3**
Arch. 416—Structures of Buildings I.....	....	....	2	2
C.E. 271—Materials Testing.....	0	2**	0	2**

* If a student has passed this subject he must take an approved elective.

† This course will not be given in 1966-67. First Year Architecture students will take Arch. 405 in 1967-68 and Arch. 425 in 1966-67.

** Denotes alternate weeks.

Second Year

Subject	First Term		Second Term	
	Lect.	Lab. or Studio	Lect.	Lab. or Studio
Arch. 420—Architectural Design II.....	1	18	1	18
Arch. 422—Experiments in space.....	3	....	....	....
Arch. 424—History of Urban Form*.....	3	....	....	....
Arch. 425—History of Urban Planning*.....	....	....	3	....
Arch. 426—Architectural Workshop II.....	2 weeks before start of lectures			
Arch. 431—Building Principles and Practice Seminar.....	....	....	3	....
Arch. 436—Structures of Buildings II.....	2	3	2	3
M.E. 437—Building Services (Mechanical).....	3	....	....	....
E.E. 438—Building Services (Electrical).....	....	....	3	....

* If a student has already passed this subject he must take an approved elective.

Third Year

Subject	First Term		Second Term	
	Lect.	Lab. or Studio	Lect.	Lab. or Studio
Arch. 440—Architectural Design III.....	3	24	1	28
Arch. 445—Theory of Architecture.....	2	....	2	....
Arch. 446—Architectural Workshop III.....	2 weeks before start of lectures			
Arch. 451—Professional Practice.....	4	....	....	....
Arch. 453—Building Economics.....	2	....	....	....
Arch. 456—Structures of Buildings III.....	2	4	....	....

COURSES IN ARCHITECTURE

305. (3) **Architectural History.**—Origins to Industrial Revolution. A history of the relationship between building forms and salient aspects of the cultures in which they appear, including a consideration of the present-day relevance of historic ideas. Textbooks: Strayer, Gatzke, Harrison, *The Course of Civilization*, Vol. 1; Hamlin, *Architecture through the Ages*; Fletcher, *A History of Architecture*. Mr. Rogatnick and Mrs. Wisnicki. [3-0; 3-0]

400. (5) **Architectural Design I.**—Observation and examination of physical phenomena and the evolved abstraction as a basis for meaningful commitment in problem-solving. Experiments in the communication of idea-concepts and their application to the environment. [1-15; 1-16]

402. (2) **Elements of Architecture.**—The investigation of movement, form and space as determinants in architecture by isolation of the operating systems and identification of the critical variables and parameters.

405. (3) **Architectural History.**—Industrial Revolution to today. Origins of the architecture of our day, including a survey of the determining theories of art and design and of the technological developments of recent times. Open only to Fourth Year Students, graduate students and to students in the Architecture programme. Textbooks: Strayer, Gatzke, Harrison, *The Course of Civilization*, Vol. 2; Gideon, *Space, Time and Architecture*. Mr. Rogatnick. [3-0; 3-0]

406. (1) **Architectural Workshop I.**—A study period of about ten days spent in the field prior to the commencement of the academic year. The purpose is to examine in some detail a selected physical environment in which people and things are significant. Communication of findings will be made through the use of various media. Staff.

411. (4) **Building Principles and Practice.**—Examination of the functional requirements and performance of building materials, components and systems in response to environmental forces. Introduction to construction practice. Textbooks: *D.S.I.R. Principles of Modern Building*, Vols. 1 and 2; *Canadian Building Digests*; *National Building Code* and supplements; Huntington, *Building Construction*. Mr. Tiers. [3-4; 3-8]

416. (2) **Structures of Buildings I.**—Objects and criteria of structures; structural problems of buildings; skeleton systems and principal members in timber and steel. Textbooks: Salvadori & Heller, *Structure in Architecture*; Gaylord and Gaylord, *Design of Steel Structures*. Mr. Wisnicki. [0-0; 2-2]

420. (6) **Architectural Design II.**—Development of the ability to design through the understanding of thought processes. Introduction to design methodology and decision-making aids. Design problems with varying emphasis upon scope and direction. Term I: design problems without precedent. Term II: problems of the building complex and its environment. [1-18; 1-18]

422. (2) **Experiments in Space.**—A lecture course ending in a studio exercise. The lectures to be in three parts: (a) the form of architectural space, (b) things in space, and (c) nature as a space determinant. The studio exercise will bring together design, structure and experiments in space as environment for man. Textbooks: Hans Reichenbach, *The Philosophy of Space & Time*; Jammer, *Concepts of Space*. Mr. Elder, Mr. Lanzius, Mr. Thomas. [3-0; 0-0]

424. (1½) **History of Urban Form.**—A history of cities in the western world with an analysis of their physical forms as related to the cultural forms of the societies and times in which they developed. Textbooks: Lewis Mumford,

The City in History; Hiorns, Town Building in History. Mr. Rogatnick and Mrs. Wisnicki. [3-0; 0-0]

425. (1½) **History of Urban Planning.**—The emergence of the city planning movement as an aspect of social and political reform traced throughout the 19th and 20th century; the roots of the planning process are examined in terms of British planning legislation, the American City Beautiful movement, and the French contribution to urban structure and design. Emphasis is placed upon urban planning as a process of Government within the general framework of profound social and economic change as the city becomes the prevailing way of life in Canada. Dr. Oberlander. [0-0; 3-0]

426. (1) **Architectural Workshop II.**—As for 406 above. Students entering Second Year will work closely and cooperatively with those entering First Year. Staff.

431. (2) **Building Principles and Practice Seminar.**—Seminars and tutorials treating selected topics in the science and technology of building and requiring investigation and presentation by students working in small groups. [0-0; 3-0]

436. (3) **Structures of Buildings II.**—Continuity in building structures; reinforced and prestressed concrete; performance and design of typical elements and entire systems in concrete; foundations. Prerequisite: Ap.Sc. 270. Textbook: Winter, Urquhart, O'Rourke, Nilson, *Design of Concrete Structures*. Mr. Wisnicki. [2-3; 2-3]

M.E. 437. **Building Services (Mechanical).**—Physics of temperature control of buildings; basic systems of heating and air conditioning; sanitation problems, water supply and distribution in buildings; elevators and other mechanical equipment. (For students in Architecture only.) Textbook: Kinzey and Sharp, *Environmental Technologies in Architecture*. Mr. Slinn. [3-0; 0-0]

E.E. 438. **Building Services (Electrical).**—Principles of electrical services and illumination in buildings. For students in Architecture. Mr. Douglas. [0-0; 3-0]

440. (7) **Architectural Design III.**—Problems of architectural design in relation to urban and sub-urban conditions; housing and community planning. More advanced analysis of planning; advanced structural studies.

The graduation project will occupy the whole of the second term. The subject must have been approved by the Council of Tutors by April 1 of the previous year. A programme will be developed in the previous term. [3-24; 1-28]

445. (2) **Theory of Architecture.**—Architecture in its contemporary setting; trends, influences and the relationship to the other arts, the behavioural sciences and the engineering sciences. The course emphasizes a search for values, principles and theory. Various lecturers, discussions and papers by students. Mr. Gerson. [2-0; 2-0]

446. (1) **Architectural Workshop III.**—Field trip to examine architecture in the urban environment. Visits to large and small offices of architects. Visits to planning offices.

451. (2) **Professional Practice.**—Nature and scope of professional competence and responsibility in architectural practice. Seminar discussions on the interaction of architect, client, contractor, allied professions and regulatory authorities. The role of the law in the practice of architecture. Office organization and procedures. Staff and visiting lecturers. [4-0; 0-0]

453. (1) **Building Economics.**—Basic principles of economics. Problems of the building project. Financing. Taxation. Mortgages, insurance and depreciation. Policies of investments. Land and building valuation. To be given by the Faculty of Commerce and Business Administration. Mr. Philip White. [2-0; 0-0]

456. (2) **Structures of Buildings III.**—Feasibility and rationality of structural systems; performance of suspension, shell and plate systems; outline of soil mechanics. Textbook: Salvadori & Heller, *Structure in Architecture*. Mr. Wisnicki. [2-4; 0-0]

THE DEGREE OF MASTER OF ARCHITECTURE

The School of Architecture offers opportunities for graduate work in three major areas: (a) Theory of Design; (b) Housing; (c) Structures. The candidate will select one of these.

Prerequisites: Graduation in Architecture, at least one year in the offices of architects or the equivalent, and completion of the academic requirements as indicated in the calendar of the Faculty of Graduate Studies.

M.Arch. Course: Thesis, counting at least 3 units, Architecture 500, and courses in Architecture and related fields selected in consultation with faculty advisers.

Graduate Courses

500. (3) **Advanced Design.**—Design project chosen by the student in consultation with the professor in charge. Project to explore the design implications within the student's programme. Staff of School and visiting critics.

503. (3) **Theory of Design.**—The exploration and analysis of theories and philosophies of architecture and design and the ways in which they affect architectural form. Mr. Rogatnick.

504. (3) **Housing Design.**—Elements of dwelling design, the design of building groups, landscaping and design of surrounding areas; lectures, seminars, and analyses. Mr. Gerson and Dr. Oberlander.

505. (3) **Form Related to Structure.**—Relationship between form and structural performance; significant loads and stresses; arch, vault, shell, membrane and space lattice effects of materials and technology; historical survey and possibilities of development. Mr. Wisnicki.

549. (3) **Thesis for Master's Degree.**—Staff of School and visiting critics.

**THE SCHOOL
OF
NURSING**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The School of Nursing calendar, 1966-67

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ACADEMIC STAFF

- MISS H. EVELYN MALLORY, B.Sc., M.A. (Columbia), R.N., Professor and Director of the School.
- MISS ELIZABETH K. McCANN, B.A., B.A.Sc. (Brit. Col.), M.S.N. (Wayne State), R.N., Associate Professor.
- MISS ALICE J. BAUMGART, B.S.N. (Brit. Col.), M.Sc. (applied) (McGill), R.N., Assistant Professor.
- MISS EILEEN CAMPBELL, B.N. (McGill), M.A. (Columbia), R.N., Assistant Professor.
- MISS MARGARET A. CAMPBELL, B.A., B.A.Sc. (Brit. Col.), M.S. (Western Reserve), R.N., Assistant Professor.
- MISS PAULINE M. A. CAPELLE, B.A., B.A.Sc. (Brit. Col.), M.A. (Chicago), R.N., Assistant Professor.
- MISS MARGARET M. STREET, B.A. (Manitoba), M.S. (Boston), R.N., Assistant Professor.
- MISS H. ELIZABETH CAWSTON, B.S.N. (Brit. Col.), M.N. (Washington), R.N., Instructor.
- MRS. MARGARET J. HARRISON, B.S.N. (Brit. Col.), R.N., Instructor.
- MISS CAROLYN A. LARSEN, B.S.N. (Brit. Col.), R.N., Instructor.
- MISS JOAN DOROTHY MORISON, B.A.Sc. (Brit. Col.), M.A. (Columbia), R.N., Instructor and Nursing Supervisor, Child Health Programme.
- MISS T. ROSE MURAKAMI, B.S.N. (Brit. Col.), R.N., Instructor.
- MISS JUNE NAKAMOTO, B.N. (McGill), R.N., Instructor.
- MRS. NETTIE NEUDORF, B.S.N. (Brit. Col.), R.N., Instructor.
- MRS. MARGARET SARAH M. NEYLAN, B.N. (McGill), R.N., Instructor.
- MISS HELEN A. NISKALA, B.N. (McGill), R.N., Instructor.
- MISS RUTH M. PALLISTER, B.S.N. (Brit. Col.), R.N., Instructor.
- MISS JULIA SHANNON, B.S.N. (Brit. Col.), R.N., Instructor.
- MISS HELEN L. SHORE, B.S.N. (Brit. Col.), R.N., Instructor.
- MISS MARGARET WIENS, B.N. (McGill), R.N., Instructor.

Lecturers from other Departments:

Donald O. Anderson, B.A., M.D. (Brit. Col.), S.M. in Hyg. (Harvard), F.R.C.P. (C); George R. F. Elliot, M.D., C.M. (Queen's), D.P.H. (Toronto); Margaret M. Johnston, B.A. (Brit. Col.), M.D., C.M. (McGill); H. K. Kennedy, M.D. (Manitoba), D.P.H. (Toronto); C. J. G. Mackenzie, M.D., C.M. (Queen's), D.P.H. (Toronto); A. John Nelson, M.B., Ch.B. (Glas.), D.P.H. R.C.P.S. (Eng.); Hamish Nichol, M.A., M.B., B.Chir. (Cantab.), M.R.C.S. (Eng.), L.R.C.P. (London); John Hartley Smith, M.B., B.Ch., B.A.O. (Queen's, Belfast), D.I.H. (London), D.P.H. (Toronto); George Szasz, M.D. (Brit. Col.); D. J. Yeo, D.D.S. (Toronto); M.P.H. (Michigan); and others.

*Clinical and Field Staff in Associated Hospitals and Agencies (1965-66)***Clinical Instructors:**

Miss M. Carmack; Miss R. Cunningham; Miss J. Douglas; Miss J. Flower; Miss A. Jenkins; Miss F. Kirkpatrick; Miss L. Knighton; Miss H. Levenick; Miss M. Lonergan; Mrs. D. Lowe; Mrs. M. Lunn; Miss S. MacDonald; Miss M. McKillop; Mrs. W. Marsden; Miss E. Maude-Moore; Mrs. J. Mitchell; Miss M. Moncrieff; Mrs. A. Murray; Miss E. Paulson; Miss U. Rutherford; Sister Mary Clare; Sister Mary Doris; Mrs. B. Tansey; Mrs. C. Toder; Miss M. Ward; Miss P. Wolf.

Field Supervisors:

Mary Clare; Sister Mary Doris; Mrs. B. Tansey; Mrs. C. Toder; Miss M. Ward; H. Boehme; Miss E. Bradshaw; Miss M. Briggs; Miss A. Buchanan; Miss A. Cumming; Miss E. Dorken; Miss J. Doree; Miss C. Eriksson; Mrs. J. Field; Mrs. Y. Finley; Mrs. E. Fisher; Miss J. Foster; Miss J. Funk; Mrs. P. Galloway; Dr. J. Gofton; Mrs. B. Hatcher; Miss E. Ingram; Miss N. Key; Miss K. Koop; Miss D. Ladner; Mrs. B. Lane; Miss N. Lee; Mrs. C. Litsky; Miss H. MacAleese; Miss J. MacIntyre; Miss F. McDonald; Miss F. McGeachie; Mrs. K. Marshall; Mrs. K. Midgley; Dr. W. Milbrandt; Mrs. E. Miller; Mrs. G. Nielsen; Miss L. Randall; Miss E. Riddell; Miss R. Ross; Miss J. Russell; Miss P. Siddons; Miss B. Smith; Miss M. Standerwick; Miss A. Stark; Miss M. Stewart; Miss J. Sutcliffe; Miss D. Vosburgh; Miss E. Ward; Miss K. Weber; Mrs. E. Weir; Miss H. Whittington; Miss A. Williams; Miss E. Williamson; Mrs. J. Wright; Miss M. Wright.

Council of the School of Nursing:

In addition to those members of professorial rank of the teaching staff of the School, the Council has the following membership: President Macdonald, (acting) Dean Armstrong, Dean McCreary, Dean Gage, Dean McCrae, K. F. Argue (Education), W. J. Bracher (Home Economics), A. Marriage (Arts), Assistant Dean C. C. Gourlay (Commerce and Business Administration), C. J. G. Mackenzie (Medicine), C. W. Miller (Arts), F. Noakes (Applied Science), R. Rosenthal (Science), J. J. Stock (Science), M. Tadych (Social Work), M. Upshall (Health Service).

SCHOOL OF NURSING

The purpose of the School is to assist students to become competent professional nurses, capable of participating with other individuals and groups in providing comprehensive health services.

With this broad purpose in mind, the following are offered:

I. For qualified high school graduates, a basic programme leading to the degree of Bachelor of Science in Nursing (B.S.N.)*. Nursing A. See page E14.

II. For qualified graduate nurses, programme leading to:
The Bachelor of Science in Nursing, Nursing D. See page E16.

A Diploma in Public Health Nursing, Nursing B. See page E18.

A Diploma in Administration of Hospital Nursing Units, Nursing C. See page E19.

A Diploma in Psychiatric Nursing, Nursing E. See page E19.

III. Part-time study for graduate nurses. See page E19.

FACILITIES FOR CLINICAL AND PUBLIC HEALTH NURSING EXPERIENCE

During 1965-66 the facilities of the following organizations were utilized to provide students with opportunities for observation and supervised experience:

B.C. Cancer Institute.

B.C. Department of Health Services and Hospital Insurance
Health Branch:

Division of Public Health Nursing.

Division of Tuberculosis Control.

Division of Venereal Disease Control.

Mental Health Services Branch:

After-Care Clinic, Burnaby.

Mental Health Centre, Burnaby.

Riverview Hospital, Essondale.

Calgary General Hospital.

Canadian Arthritis and Rheumatism Society, Vancouver.

G. F. Strong Rehabilitation Centre, Vancouver.

Greater Vancouver Metropolitan Board of Health.

Greater Victoria Metropolitan Board of Health.

Health Centre for Children, Vancouver General Hospital, Vancouver.

Holy Family Hospital, Vancouver.

Langley Memorial Hospital.

Lions Gate Hospital, North Vancouver.

Occupational Health Services: American Can Company of Canada; B.C. Hydro and Power Authority; B.C. Telephone Company; Canada Packers Ltd.; Carling Breweries (B.C.) Ltd.; Hudson's Bay Company Retail Department Store; Imperial Oil Company Ltd.; Shellburn Refinery; Simpsons-Sears Company Ltd.; T. Eaton Company of Canada Ltd.

Pearson Hospital, Vancouver.

* The colour of the hood is scarlet with twisted cord of university blue and white.

Royal Columbian Hospital, New Westminster.
Royal Jubilee Hospital, Victoria.
St. Joseph's Hospital, Victoria.
St. Paul's Hospital, Vancouver.
St. Vincent's Hospital, Vancouver.
Shaughnessy Hospital, Vancouver.
University of Saskatchewan Hospital, Saskatoon.
Vancouver General Hospital.
University of British Columbia Child Health Programme.
University of British Columbia Child Study Centre.
Workmen's Compensation Board Rehabilitation Centre, Vancouver.
York House School for Girls, Vancouver.

GENERAL INFORMATION AND REGULATIONS

Admission

1. All inquiries relating to admission to the School of Nursing should be addressed to: The Director, School of Nursing, University of British Columbia, Vancouver 8, B.C.

2. Requirements for admission to Nursing are included with descriptions of the various programmes offered.

3. Since facilities for nursing experience and other required field work may limit the number of students who can be admitted, applications should be submitted early. First application for graduate-nurse programmes should be received by July 1; applications for the Basic Degree Programme by August 1. Requests for application forms, addressed to the Director of the School, should specify the particular programme in which the applicant is interested.

4. The Faculty reserves the right of selection of all students for admission and readmission to the School. Unless distance from the University makes it impracticable, a personal interview is required prior to acceptance.

Registration

Second and third year nursing students ("A" programme only) register on Monday, August 29.

All other students register in the regular university registration period.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Field Work

Field work included in the Final Year of the degree programmes and in the diploma programmes is usually provided in January, May, and June. While field work requirements may vary for different students, all requirements must be completed satisfactorily before a student can be recommended for graduation.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's Office.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. The student will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Costs

1. Fees for full-time students—*subject to change without notice:*

First Term Fees—Payable in full at the time of registration. However, students may pay both first and second term fees at time of registration.

Second Term Fees—Payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

	1st Term	2nd Term	Total
	(includes A.M.S. fee)		
Nursing (B.S.N. or Diploma)—			
All Years	219.00	190.00	409.00

Part-time Students—see the General Information bulletin.

2. For costs of board and lodging see the General Information bulletin.

3. Because nursing practice is included, there are additional expenses, for uniforms, travel, and field work, which vary with the different programmes. Students should be prepared to have most of their field work outside the Vancouver area and therefore should include living and travel costs for this period in estimating total expenses. The School will provide applicants with information regarding these additional costs.

Examinations and Advancement

1. Regardless of prior credits, full-time students must complete each year a programme equal in unit value to the total number of units normally required for that year.

2. Examinations held in December and April are obligatory for all students. Requests for special consideration on account of illness or domestic affliction must be submitted to the Director not later than two days following the close of the examination period. For information regarding medical certificates, see the General Information bulletin.

3. In order to pass, candidates must obtain at least 50 per cent. in each subject. In courses including both lecture and laboratory work, students are required to pass in both the written examinations and the laboratory work before standing in the subject will be granted. In courses that include nursing practice, students must demonstrate satisfactory performance as well as pass the written examinations before standing will be granted.

4. Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.

5. Standing for the year is recorded as follows: First Class, 80 per cent. or over; Second Class, 65-79 per cent.; Pass, 50-64 per cent.

6. At graduation, Honours standing will be granted to those students who obtained First Class standing in the Final Year and an average of at least 75 per cent., with no supplementals, in each of the preceding years. To be eligible for Honours standing, students must have carried a full programme each year; and students in the Nursing "D" programme must have spent two academic years in full-time study at the University.

7. A student who fails for a second time in University studies is required to withdraw.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why she believes the content of her paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less.

Supplemental Examinations

1. At the discretion of the Faculty, and if a student's general standing in the final examinations of any year is sufficiently high, she may be permitted to write supplemental examinations in the subject or subjects in which she failed. Notice will be sent to all students granted supplemental privileges.

2. Supplemental examinations are held in August and at the time of the regular April examinations. Special examinations will not be granted, except by special permission of the Faculty and on payment of a fee of \$20 per paper.

3. Applications for supplemental examinations, accompanied by the necessary fees, must be received by the Registrar by July 8. The fees are \$7.50 for each examination written at the University and \$10 for each examination written at any of the following outside centres: Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

No refund will be made if the examination is not written. However, if within 10 days of the scheduled examination the candidate explains to the Registrar her reasons for not writing, consideration will be given to a refund. The refund, if made, will be \$5.00 only.

4. No student may proceed to the work of a higher year without having completed satisfactorily all previous requirements, except by special permission of the Faculty.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for her own use a copy of her record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of Christmas or mid-term examinations.

Student records are *confidential*. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

BASIC DEGREE PROGRAMME

Nursing A

With the cooperation of St. Paul's Hospital and other hospitals and health agencies, which provide nursing experience for students, the University of British Columbia offers a four-year programme leading to the degree of Bachelor of Science in Nursing (B.S.N.). Based on the belief that the professional nurse should be a broadly educated person, the programme combines the study of general Arts and Science subjects with the special preparation needed to equip the individual for the practice of nursing.

Through lectures, readings, class discussions, individual and group assignments, demonstrations, laboratory work and planned and guided nursing experiences, students are provided with opportunities to develop:

(i) a broad concept of nursing as a service that is concerned with the promotion of mental and physical health as well as with the care of the sick, and with the welfare of the family and the community as well as that of the individual patient; a service that is rendered in homes, schools, clinics, industrial health services and other community agencies as well as in hospitals;

(ii) understanding of biological, social, psychological and economic factors that influence health and disease;

(iii) understanding of fundamental principles on which good nursing care is based, and a satisfactory level of skill in the bedside care of patients;

(iv) understanding of principles of teaching and their application to the work of the nurse;

(v) understanding of community resources for the care and prevention of illness and the promotion of health;

(vi) understanding of fundamental principles of administration and supervision, and of organization of hospitals and other health agencies;

(vii) appreciation of the significance and responsibilities of professional relationships and the importance of cooperative effort.

Upon satisfactory completion of the programme, the graduates are qualified for staff nursing positions in hospitals and in public health agencies. As they gain experience, individuals with ability should be able to progress to more senior positions.

Admission Requirements

- (a.) Completion of the following courses selected from First Year University courses or their equivalent at another approved university or in Grade 13:

English 100

Chemistry 101, 102 or 110

Mathematics 110 or 120

Biology 101 (or the equivalent), and one other course which may be:

Economics, Geography, History, Philosophy, Psychology, a foreign language, or another approved elective.

Students must obtain a final mark of at least 60 per cent. in either Chemistry or Biology or, in lieu of this, an overall average of at least 60 per cent. In other subjects at least 50 per cent. is required.

(N.B.: Academic requirements indicated above refer to British Columbia students. Prospective applicants from outside British Columbia should consult the Director of the School of Nursing regarding required

subjects and standing. Additional information given in General Information bulletin.)

(b.) Good health.

(c.) Personal suitability.

Application for admission, on forms obtained from the School of Nursing, should be submitted not later than August 1. Students are advised to establish contact with the School as early as possible, e.g., when they register for First Year Arts or Science or during their Grade 13 Year.

The Programme

The programme is four calendar years in length, with a summer vacation of at least six weeks and the usual Christmas vacation of approximately ten days.

First Year

Chemistry 230	3 units
Microbiology 200	3 units
Psychology 100 or an elective	3 units
Nursing 155 Anatomy and Physiology	4 units
Nursing 156 Introduction to Nursing	3 units
Nursing 157 Orientation to Nursing in Hospital	5 units
Nursing 167 Introduction to the Nursing Profession	1 unit

For description of courses see pages E20-24.

Second and Third Years

During these two years students develop increasing ability to give comprehensive nursing care. The concurrent instruction and supervised nursing experience are planned to coincide with the usual university week, namely a five-and-a-half day week during term and a five-day week during the summer period.

While the sequence of courses varies for different groups of students, requirements listed below must be completed satisfactorily before students can be admitted to the Fourth Year of the programme.

English 200	3 units
Sociology 200 and 301	6 units
N. 250 Human Growth and Development I	3 units
N. 263 Public Health Nursing I	1 unit
N. 290 Medical-Surgical Nursing I	5 units
N. 292 Obstetric Nursing I	2½ units
N. 294 Paediatric Nursing I	2½ units
N. 296 Psychiatric Nursing	5 units
N. 363 Public Health Nursing II	3 units
N. 390 Medical-Surgical Nursing II	5 units
N. 392 Obstetric Nursing II	2½ units
N. 394 Paediatric Nursing II	2½ units
N. 395 Nursing Team Leadership	1 unit

Fourth Year

Sociology 315 or 420	3 units
N. 450 Human Growth and Development II	1 unit
N. 454 Preventive Medicine	3 units
N. 458 Teaching	2 units
N. 460 Administration	3 units
N. 463 Public Health Nursing III	3 units
N. 467 The Nursing Profession	1 unit
N. 485 Nursing Study	1 unit
N. 483 Field Work	

Upon satisfactory completion of all requirements, students will receive the degree of Bachelor of Science in Nursing.

Board and Residence Accommodation

For information regarding board and residence accommodation, refer to the General Information bulletin obtainable on request from the Registrar's Office. With the exception of meals and the laundering of uniforms provided at specified times by some of the hospitals where students engage in clinical nursing practice, students are financially responsible for their own maintenance throughout the entire four years of the programme.

Living accommodation for a limited number of Second and Third Year students is made available by some of the hospitals that provide clinical experience. In the allocation of this accommodation, available only on the basis of a complete term (Fall, Spring, or Summer) and only during the period of clinical experience in the particular hospital, priority is given to students whose homes are outside the Vancouver area. For this accommodation students are required to pay in advance the rental for the complete term.

More detailed information regarding costs will be provided by the School of Nursing.

POSTBASIC DEGREE PROGRAMME

Nursing D

The ultimate goal of this programme is essentially the same as that of the basic degree programme (Nursing A). It is designed to enable the nurse who has graduated from a non-degree basic programme to supplement and extend her education, and thus to increase her ability to give a competent professional service in all fields of nursing, including public health. The programme includes preparation for teaching and study of the fundamentals of supervision and administration.

Upon graduation the individual's qualifications for employment and the positions for which she can be recommended will depend to some extent upon her experience prior to admission.

Admission Requirements

1. Academic: Secondary School Graduation (University Programme) of the Province of British Columbia, or its equivalent, with evidence of adequate ability to meet the demands of the programme. This is the minimum academic requirement for all applicants, irrespective of the province or country in which the applicant received her secondary school education.

2. Personal: Good physical and emotional health, and the personal qualities considered essential for success in the chosen field.

3. Nursing: Satisfactory completion of the basic course in a recognized school of nursing and registration in the province or country from which the applicant comes. The basic course should have included adequate instruction and experience in the major clinical services and an orientation to public health nursing.

Where deficiencies are found to exist for which suitable supplementary instruction and experience can be obtained, the School of Nursing will assist the student in making arrangements for such experience.

4. Credit for previous courses:

(a) Provided sufficiently high standing was achieved in the final examinations, credit will be granted for appropriate Grade 13 subjects (English, Mathematics, and Chemistry), and for appropriate Arts and Science courses completed at this or another approved university.

(b) At the discretion of the Faculty, some credit may be granted for postbasic nursing courses completed at this or another approved university.

The Programme

Total requirements listed below represent three years of study beyond the level of University entrance. Although pre-requisites set limitations in respect to the sequence of courses, some adaptation to the needs and interests of individual students is possible. Copies of three different plans for fulfilling requirements are available from the School of Nursing. While some courses may be taken on a part-time basis, this is not the most effective plan and, in order to qualify for the degree, students must spend the equivalent of two academic years in attendance at the University, one of which must be the final year.

Before registering for any of the required courses, prospective applicants are advised to consult the Director of the School regarding their plans.

Microbiology 200	3 units
Chemistry 101, 102 or 110 and 230	6 units
English 100 and 200 or an elective approved by the Director ..	6 units
Mathematics 110 or 120	3 units
Sociology 200, 301, and 315 or 420	9 units
*Zoology 303	3 units
N. 252 Human Growth and Development D I	2 units
N. 296 Psychiatric Nursing	5 units
N. 343 Public Health Nursing	6 units
N. 356 Nursing D II	2 units
N. 450 Human Growth and Development D II	1 unit
N. 454 Preventive Medicine	3 units

*Biology 101 or Zoology 105, or a satisfactory alternative, is prerequisite to Zoology 303.

N. 458 Teaching	2 units
N. 460 Administration	3 units
N. 467 The Nursing Profession	1 unit
N. 485 Nursing Study	1 unit
N. 483 Field Work	

For description of courses see pages E21 - 24.

Upon satisfactory completion of the above requirements, students receive the degree of Bachelor of Science in Nursing.

POSTBASIC DIPLOMA PROGRAMMES

Nursing B, C, and E

Admission Requirements

1. Academic: Secondary School Graduation (University Programme).
2. Personal: Good physical and emotional health, and the personal qualities considered essential for success in the chosen field.
3. Nursing:
 - (a). Satisfactory completion of the basic course in a recognized school of nursing and registration in the province or country from which the applicant comes.
 - (b). A period of satisfactory graduate-nurse experience.
 - (c). Preferences will be given to applicants who have had a basic level course in psychiatric nursing, including clinical experience, or, in lieu of that, a period of satisfactory employment in an active psychiatric unit. (N.B. This statement is not applicable to the Nursing E programme.)

PUBLIC HEALTH NURSING

Nursing B

This programme, approximately nine months in length, is designed to help selected graduates of non-degree basic programmes to increase their knowledge and understanding of nursing and their ability to apply these to public health nursing practice.

The Programme

Sociology 200	2 units
N. 202 Principles of Teaching	1 unit
N. 327 The Nursing Profession	1 unit
N. 340 Interpersonal Relationships	4 units
N. 343 Public Health Nursing	6 units
N. 344 Preventive Medicine	3 units
N. 346 Field Work	

For course descriptions see page E22.

Upon satisfactory completion of the above requirements, students receive a Diploma in Public Health Nursing.

ADMINISTRATION OF HOSPITAL NURSING UNITS

Nursing C

This programme, approximately nine months in length, is designed to help selected graduates of non-degree basic programmes to increase their knowledge and understanding of nursing and their ability to apply these to nursing service positions entailing administrative and supervisory functions with special reference to those of the head nurse.

While the curriculum includes an introduction to nursing education and the teaching responsibilities of the head nurse, it is not possible in the time available to provide adequate preparation for instructors, and this programme does not attempt to do so. Nurses interested in preparing themselves for teaching positions are advised to consider the Postbasic Degree Programme (Nursing D).

The Programme

Sociology 200	3 units
N. 202 Principles of Teaching	1 unit
N. 220 Core Concepts of Nursing	3 units
N. 327 The Nursing Profession	1 unit
N. 340 Interpersonal Relationships	4 units
N. 342 Nursing Service Administration	6 units
N. 347 Field Work	

For Course Descriptions see pages E22 - E24.

Upon satisfactory completion of the above requirements, students receive a Diploma in Administration of Hospital Nursing Units.

PSYCHIATRIC NURSING

Nursing E

Approximately nine months in length, this programme is designed to help selected graduates of non-degree basic programmes to increase their knowledge and understanding of nursing and their ability to apply these in psychiatric nursing practice, with special emphasis on the role of the nursing team leader.

The Programme

Psychology 206	3 units
Sociology 200	3 units
N. 326 Psychiatric Nursing	8 units
N. 327 The Nursing Profession	1 unit
N. 336 Field Work	

For Course Descriptions see pages E22 - E24.

Upon satisfactory completion of the above requirements, students receive a Diploma in Psychiatric Nursing.

PART-TIME STUDY

Nurses unable to arrange for full-time attendance may be permitted to register for certain courses regularly offered. Credit for courses completed satisfactorily may be granted only under the following conditions:

1. Toward one of the Diploma programmes — (Nursing B, C, or E) provided:

(a.) the student is qualified for admission to the programme before she registers for the course, and

(b.) all requirements are met within a period of three calendar years.

2. Toward the degree of Bachelor of Science in Nursing provided:

(a.) the student is qualified for admission to the programme and has completed satisfactorily all prerequisites before she registers for the course;

(b.) all requirements are met within a period of six calendar years for those who have to take the entire programme, or within a proportionately shorter period of time for those who may be granted advanced credits (e.g. for Grade 13 subjects); and

(c.) at least one academic year (preferably the Final Year) is spent in full-time study at the University, with at least half of the programme for that year consisting of courses taught in the School of Nursing.

Nurses considering part-time study should arrange for a personal interview with the Director of the School.

COURSE DESCRIPTIONS

The number of units assigned to a course is given in round brackets immediately following the course number.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms. [2-3; 2-3]

1 lecture and 2 hours laboratory per week, first term. [1-2; 0-0]

1 lecture and 2 hours laboratory per week, second term. [0-0; 1-2]

2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms. [2-3-2; 2-3-2]

In the clinical nursing courses the ratio between class and supervised nursing experience varies but in the overall programme it is approximately 1:3. The unit values for these courses are based on both instruction and supervised nursing experience. In respect to the latter, 120-150 hours are considered to have a value of one unit.

Degree Courses

155. (4) **Anatomy and Physiology.**—Structure and function of the human body. [4-0; 4-0]

156. (3) **Introduction to Nursing.**—Basic principles of elementary nursing and their application to the care of patients. [2-3; 2-3]

157. (5) **Orientation to Nursing in Hospital.**—An introduction to the comprehensive nursing care of selected patients.

167. (1) **Introduction to the Nursing Profession.**—The evolution of nursing, including an introduction to the status of nursing in Canada today and the framework in which it functions. [1-0; 1-0]

250. (3) **Human Growth and Development I.**—The study of human growth, development, behaviour, and communication basic to an understanding of and skill in interpersonal relationships in the practice of nursing. [3-0; 3-0]

252. (2) **Human Growth and Development D I.**—Some concepts basic to deeper understanding of and greater skill in interpersonal relationships, including those pertaining to human growth, development, behaviour, and communication. [2-0; 2-0]

263. (1) **Public Health Nursing I.**—Philosophy, development, and organization of health and welfare services; epidemiology of common communicable diseases. [1-0; 1-0]

290. (5) **Medical-Surgical Nursing I.**—Concepts basic to the nursing of patients with altered body structure and function and practice in the application of these concepts to the care of adult patients.

292. (2½) **Obstetric Nursing I.**—Principles fundamental to the care of the normal newborn baby and of the mother during a normal maternity cycle.

294. (2½) **Paediatric Nursing I.**—Instruction and experience in the application of concepts and principles of child care to the nursing of children.

296. (5) **Psychiatric Nursing.**—Concepts and principles basic to comprehensive care of psychiatric patients, and their application to the nursing care of selected patients and groups of patients.

356. (2) **Nursing D II.**—Exploration of current concepts, trends, and principles fundamental to the provision of comprehensive nursing care. [2-0; 2-0]

363. (3) **Public Health Nursing II.**—Scope and nature of public health nursing including consideration of intra- and inter-agency relationships, public health education, and citizen participation; basic concepts of disaster nursing; experience in a hospital emergency department; experience with the Victorian Order of Nurses.

390. (5) **Medical-Surgical Nursing II.**—Comprehensive nursing care with emphasis on approaches designed to stimulate and support adaptive processes in selected patients with acute and long-term illnesses.

392. (2½) **Obstetric Nursing II.**—Further instruction and experience in the comprehensive nursing care of mothers and newborn babies, including those who present physical, emotional, and/or social problems.

394. (2½) **Paediatric Nursing II.**—Further instruction and experience in the comprehensive nursing care of children in hospital.

395. (1) **Nursing Team Leadership.**—Experience and directed study focussed on the leadership responsibilities in a nursing team.

450. (1) **Human Growth and Development II.**—Further study of psychological development of normal human beings with emphasis on unconscious motivations and processes. [0-0; 2-0]

454. (3) **Preventive Medicine.**—The epidemiological approach to the control of disease (communicable and non-communicable, acute and chronic) and to the promotion of health; environmental sanitation and food control. [3-0; 3-0]

458. (2) **Teaching.**—Further consideration of principles and planning related to the teaching of patients, nursing personnel, and nursing students; and an introduction to the fundamentals of curriculum construction. [2-0; 2-0]

460. (3) **Administration.**—Fundamentals of administration and their application in nursing services. [3-0; 3-0]

463. (3) **Public Health Nursing III.**—The components and process of family health guidance in homes, schools, clinics, classes and industry; statistics, nutrition, teaching expectant parents and other collateral subjects. [3-0; 3-0]

467. (1) **The Nursing Profession.**—Evolution, functions, and activities of

professional nursing associations, and responsibilities and privileges of membership therein; present patterns, trends, and problems of nursing education. [1-0; 1-0]

483. **Field Work.**—Planned observation and guided participation in (a) generalized public health nursing, and (b) clinical teaching.

485. (1) **Nursing Study.**—An original study and written report of a specific nursing problem selected in consultation with the faculty.

Diploma Courses

202. (1) **Principles of Teaching.**—Basic concepts of learning and their application to teaching. [2-0; 0-0]

220. (3) **Core Concepts of Nursing.**—Core concepts of clinical nursing and their implications for planning, providing and evaluating nursing care.

326. (8) **Psychiatric Nursing.**—Consideration of selected concepts and techniques related to human behaviour, human groups, and psychiatric disorders; and guided practice in their application to nursing, with emphasis on the role of the nursing team leader.

327. (1) **The Nursing Profession.**—Evolution, functions, activities and relationships of professional nursing associations, with special reference to those in Canada; present patterns, trends, and problems of nursing education. [1-0; 1-0]

336. **Field Work.**—Guided experience as nursing team leader in a psychiatric nursing unit.

340. (4) **Interpersonal Relationships.**—Concepts basic to deeper understanding of and greater skill in interpersonal relationships, including those pertaining to group dynamics, and human growth, development, communication, and behaviour. [4-0; 4-0]

342. (6) **Nursing Service Administration.**—Fundamentals of administration and their application in the hospital nursing service, with particular reference to the administration of the nursing unit; and collateral topics, including health and welfare organizations, contributing to understanding of nursing service administration in the hospital setting. [6-0; 6-0]

343. (6) **Public Health Nursing.**—Philosophy, development, and organization of health and welfare services; the scope and nature of public health nursing including consideration of intra- and inter-agency relationships, citizen participation, public health education, family health guidance, administrative aspects, statistics, nutrition, teaching of expectant parents, methodology, and other collateral subjects. [6-0; 6-0]

344. (3) **Preventive Medicine.**—The epidemiological approach to the control of disease (communicable and non-communicable, acute and chronic) and to the promotion of health; environmental sanitation and food control. [3-0; 3-0]

346. **Field Work.**—Planned observation and guided participation in public health nursing.

347. **Field Work.**—Planned observation and guided participation in the administration of hospital nursing units.

Courses in the Faculty of Arts and in the Faculty of Science that are included in the various Nursing programmes.

101. **Principles of Biology.**—An introductory course emphasizing principles of wide application to all living organisms, including cell structure and function, the mechanism of inheritance, evolution, and adaptation to

environment. A comparative approach to the unity and diversity of organisms will be stressed. A one hour tutorial is required each week for those students who have not previously had Biology 11 or its equivalent in high school.

[3-3; 3-3]

Chemistry 101: General Chemistry.—Fundamental theories, periodic table, descriptive inorganic chemistry, chemical calculations, modern valency concepts, elementary nuclear chemistry.

[3-3; 3-3]

Chemistry 102: General Chemistry.—Similar to Chemistry 101 but in somewhat more detail.

[3-3; 3-3]

Chemistry 110: Principles of Chemistry.—A study of the fundamental principles of Chemistry with particular reference to the nature of solutions, the solid state and the molecular structure of both inorganic and organic substances. This course is intended for prospective Science and Engineering students who have not taken Chemistry 12. Prerequisites: Chemistry 11, Physics 11. Mathematics 120 and a first year Physics course must precede or be taken concurrently.

[3-3-1; 3-3-1]

Chemistry 230: The fundamental principles of modern organic chemistry including a discussion of the main classes of organic compounds. Prerequisite: Chem. 110 or 102 (or 101).

[3-3; 3-3]

English 100: Literature and Composition.—A study of the principles of composition and of some twentieth-century examples of drama, short story, poetry and novel. Essays and exercises are required.

[4-0; 4-0]

English 200: Literature and Composition.—A study of literature from Chaucer to the nineteenth century, and of the principles of composition.

[3-0; 3-0]

Mathematics 110.: Fundamental Mathematics.—Functions, analytic geometry, exponentials and logarithms, introduction to calculus, statistics and probability. This course will not be accepted as a prerequisite to Mathematics 155, 156, 200, 202, 220, 221, 240.

[3-1; 3-1]

Mathematics 120: Fundamental Mathematics.—Trigonometry, analytic geometry and calculus. This course is prerequisite to Mathematics 155, 156, 200, 202, 220, 221, 240. It is a required course for all students in the Faculty of Science and for all students intending to take Engineering, Architecture or a major or an Honours Course in mathematics.

Microbiology 200: Introductory Bacteriology.—History of bacteriology; bacteria in nature; classification of bacterial forms; methods of culture and isolation; relation of bacteria to agriculture, industry, veterinary science, public health and sanitation.

[2-3; 2-3]

Psychology 100: Introductory Psychology.—A scientific and practical study of basic forms of human behaviour including the motivational, sensory, mental, social, modifiable, emotional, adjustive, individual, personal and transitional nature of human activity.

[3-0; 3-0]

Psychology 206: Dynamics of Behaviour.—An experimental, dynamic and social approach to behaviour adjustment with special reference to applications. If recommended by the School of Nursing, students in the Nursing E programme may be admitted to Psychology 206 without the prerequisite of Psychology 100.

[3-0; 3-0]

Sociology 200: Introduction to Sociology.—A general introduction to the sociological analysis of selected topics (such as religion, work, politics, stratification, bureaucratic organizations, kinship, socialization, and particular social roles).

[3-0; 3-0]

Sociology 301: Deviance.—Forms of deviance from an institutional order; the social roles of deviants; attitudes toward nonconformity; punishment

and cure; evasion of rules; contributions of deviance to the functioning of social systems. [3-0; 3-0]

Sociology 315: Social Stratification.—The study of tendencies toward equality and inequality. Manifestations of inequality—occupation, education, ethnic group, income, power—and their consequences. [3-0; 3-0]

Sociology 420: The Sociology of Work.—Theoretical problems and empirical research in the meaning and social organization of work and the composition of occupational roles. [3-0; 3-0]

Zoology 303: Introduction to Vertebrate Physiology.—Organ physiology. Prerequisites: First Year Chemistry. If recommended by the School of Nursing, students in the Nursing D programme may be admitted to Zoology 303 without Zoology 105. [2-2; 2-2]

Accepted applicants for the **Basic Degree Programme (Nursing A)** who have already completed Psychology 100 and, therefore, have an elective in First Year Nursing, will consult a member of faculty at the time of registration.

Students in the **Postbasic Degree Programme (Nursing D)** who prefer an alternative to English 200 may select instead another Second Year level Arts course. The course chosen by the student must be approved by the Director of the School of Nursing. Provided the student has the prerequisites, and provided the selected course can be fitted into the timetable, any one of the following would be acceptable: Anthropology 200; Economics 200; History 201, 202, 204, or 212; Political Science 200; Religious Studies 200; any Second Year course in a foreign language.

**THE FACULTY
OF
ARTS**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

Calendar of the Faculty of Arts, 1966-1967

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FACULTY OF ARTS

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- ROBERT E. KNOX, M.A. (Occid.), Ph.D. (Oregon), Assistant Professor.
- JUAN PASCUAL-LEONE, M.D. (Valencia), LPs (Geneva), Assistant Professor.
- WILLIAM M. PETRUSIC, B.A. (Brit. Col.), M.A., Ph.D. (Michigan), Assistant Professor.
- GERALD E. PLUM, B.A. (Wayne State), Ph.D. (Chicago), Assistant Professor.
- MISS REVA POTASHIN, M.A., Ph.D. (Toronto), Assistant Professor.
- DONALD L. G. SAMPSON, M.A., Ph.D. (Toronto), Assistant Professor.
- RICHARD C. TEES, B.A. (McGill), Ph.D. (Chicago), Assistant Professor.
- RODERICK WONG, B.A. (Brit. Col.), M.A. (West. Michigan), Ph.D. (North-western), Assistant Professor.
- A. E. COX, B.A. (Brit. Col.), M.A. (Toronto), Lecturer.
- J. C. NUTTALL, B.A., B.Ed. (Queen's, Belfast), Lecturer.
- J. E. B. RYAN, B.A. (Brit. Col.), M.A., Ph.D. (Toronto), Lecturer.
- A. F. SHIRHAN, M.A. (Brit. Col.), Lecturer.

Department of Religious Studies

- WILLIAM NICHOLLS, M.A. (Cantab.), Professor and Head of the Department.
- ARTHUR E. LINK, B.A., M.A., Ph.D. (Calif.), Professor.
- CHARLES P. ANDERSON, A.B. (Willamette), B.D. (Union Theological Seminary, N.Y.), Assistant Professor.
- HANNA E. KASSIS, B.A. (American Univ., Beirut), Ph.D. (Harvard), Assistant Professor.

- JOSEPH I. RICHARDSON, B.A., B.D. (McMaster), S.T.M. (Union Theological Seminary, N.Y.), Dean of Carey Hall, Part-time Lecturer.
 J. J. FRANCIS FIRTH, C.S.B., M.A. (Toronto), M.S.L. (Pontif. Inst., Toronto), Part-time Lecturer.

Department of Romance Studies

- LAURENCE L. BONGIE, B.A. (Brit. Col.), Docteur de l'Université de Paris, Professor of French and Acting Head of the Department.
 MISS DOROTHY DALLAS, M.A. (Brit. Col.), Docteur de l'Université de Paris, Professor of French.
 DENNIS MCNEICE HEALY, B.A. (Alta.), L. ès L. (Paris), Docteur de l'Université de Paris, Professor of French and Dean, Faculty of Arts.
 HAROLD V. LIVERMORE, M.A. (Cantab.), Professor of Spanish and Portuguese.
 GERARD R. TOUGAS, B.A. (Alta.), M.A. (McGill), Ph.D. (Stanford), Professor of French.
 MISS RACHEL GIESE, M.A., Ph.D. (Wis.), Associate Professor of Italian.
 KARL I. KOBBERVIG, B.A., Ph.D. (Wash.), Associate Professor of Spanish and Italian.
 J. A. McDONALD, M.A. (Brit. Col.), Associate Professor of Spanish.
 D. BAUDOUIN, Agrégé des Lettres (France), Assistant Professor of French.
 EDWARD A. BIRD, B.A. (Brit. Col.), Docteur de l'Université de Paris, Assistant Professor of French.
 MISS KATHERINE BREARLEY, M.A. (Brit. Col.), Docteur de l'Université de Paris, Assistant Professor of French.
 MISS HEATHER FRANKLYN, B.A., Ph.D. (Exeter), Assistant Professor of French.
 FRANK R. HAMLIN, B.A., Ph.D. (Birm.), Assistant Professor of French.
 RICHARD G. C. HOLDAWAY, B.A. (Nott.), Ph.D. (Hull), Assistant Professor of French.
 LUIS JENARO-MACLENNAN, B.A. (Oviedo), M.A. (Oxon.), D.Phil. (Madrid), Assistant Professor of Spanish and Italian.
 HAROLD C. KNUTSON, M.A. (Minn.), Ph.D. (Calif.), Assistant Professor of French.
 ALISTAIR R. MACKAY, B.A. (Brit. Col.), M.A., Ph.D. (Calif.), Assistant Professor of French.
 DAVID J. NIEDERAUER, M.A., Ph.D. (Calif.), Assistant Professor of French.
 MISS MARGUERITE A. PRIMEAU, M.A. (Alta.), Assistant Professor of French.
 MISS HELEN M. C. PURKIS, M.A. (Oxon.), Docteur de l'Université de Paris, Assistant Professor of French.
 CLAUDE TREIL, B.A. (Brit. Col.), M.A., Ph.D. (Laval), Assistant Professor of French.
 TOMAS BARTROLI, B.A. (Western Ontario), M.A. (Brit. Col.), Senior Instructor in Spanish.
 IVOR A. ARNOLD, B.A. (London), M.A. (Brit. Col.), Instructor in French.
 MRS. STEFANIA CICCONE, M.A. (Brit. Col.), Instructor in Italian.
 MRS. GIUSEPPINA DE STEFANIS, Dott. Lett. (Università Bocconi), Instructor in Italian.
 MISS DORIA E. KAPLAN, B.A. (Louisville), M.A. (Calif.), Instructor in French.
 MRS. LOUISE KNUTSON, M.A. (Denver), Instructor in French and Spanish.
 MISS ROSEMARIE LANG, B.A. (Sask.), M.A. (Toronto), Instructor in French.

JAMES PANTER, B.A., M.A. (Nott.), Instructor in French.
 FLOYD B. ST. CLAIR, B.A. (Stanford), Instructor in French.
 PADRAIG JOHN BLENKINSOP, B.A. (Oxon.), Lecturer in French.
 MRS. ROSE B. MCBRIDE, B.A., M.A. (Brit. Col.), Lecturer in French.

Department of Slavonic Studies

CYRIL BRYNER, A.B. (Stanford), Ph.D. (Prague), Professor.
 H. E. RONIMOIS, M.Sc. (Tartu), Ph.D. (London), Professor.
 WILLIAM J. ROSE, B.A. (Man.), M.A. (Oxon.), Ph.D. (Cracow), LL.D. (Brit. Col.), D.D. (Union College), F.R.Hist.S., F.R.S.C., Professor Emeritus, Honorary Lecturer.
 JAMES O. ST. CLAIR-SOBELL, M.A. (Melbourne), Ph.D. (Graz.), F.R.S.C., Professor of Comparative Philology.
 STANLEY Z. PECH, M.A. (Alta.), State Dipl. (Prague), Ph.D. (Colorado), Associate Professor.
 VALERIAN REVUTSKY, M.A. (Toronto), Diploma in Drama (Moscow), Associate Professor.
 ALEXANDER W. WAINMAN, M.A. (Oxon.), Associate Professor.
 BOGDAN CZAYKOWSKI, B.A. (Dublin), M.A. (London), Assistant Professor.
 DANIEL DOROTICH, B.Th. (Collonges), B.A. (Sir George Williams), M.A., Ph.D. (McGill), Assistant Professor.
 ALEX P. HARSHENIN, M.A. (Brit. Col.), Assistant Professor.
 MRS. IRINA M. REID, M.A. (Brit. Col.), L.R.S.M., A.R.T.C., Assistant Professor.
 JAN. J. SOLECKI, B.Com. (London), M.A. (Brit. Col., Wash.), Assistant Professor.
 VLADIMIR GROSS, M.A. (Washington), Instructor.
 MISS IRINA REBRIN, B.A. (Peking), Instructor.
 MISS HANNA TERLECKA, M.A. (Edinburgh), Instructor.
 GARETH WILLIAMS, M.A. (Oxon.), Instructor.
 ALEXANDER F. ZWEERS, Litt.Slav.Drs. (Amsterdam), Instructor.
 JAN FREYMAN, Mag.Ing. (Warsaw), Lecturer.
 MICHAEL V. KOURNOSOFF, M.A. (Brit. Col.), Lecturer.
 ARAM H. OHANJANIAN, B.A. (Toronto), Lecturer.

Theatre

JOHN BROCKINGTON, B.A. (Brit. Col.), D.F.A. (Yale), Associate Professor and Head of the Department.
 DONALD E. SOULE, B.A. (Yale), M.A. (Wisconsin), Ph.D. (Stanford), Associate Professor.
 KLAUS G. STRASSMAN, Ph.D. (Stanford), Assistant Professor.
 STANLEY A. WEESE, B.A. (Min.), M.A. (Illinois), Instructor.
 M. NORMAN YOUNG, B.A. (Brit. Col.), Technical Director and Lecturer.
 MISS DOROTHY SOMERSET, A.B. (Radcliffe), LL.D. (Brit. Col.), Associate Professor Emerita; Lecturer.
 KEITH SIMPSON, B.A., B.Ed. (Brit. Col.), M.A. (Washington), Lecturer.

Lecturers from other Departments:

MISS JANIE STEVENSON, L.R.A.M., L.G.S.M., A.L.A.M., Assistant Professor, Faculty of Education.

MRS. JOCELYN A. UNDERWOOD, M.S. (Wisconsin), Instructor, Faculty of Education.

MRS. MARCIA SNIDER, B.A. (Bennington), M.S. (Wisconsin), Lecturer, School of Physical Education and Recreation.

1966-67

THE FACULTY OF ARTS

The Faculty of Arts offers a wide range of programmes of study that lead to the degrees of Bachelor of Arts, Master of Arts and Doctor of Philosophy.

The Department of Music of the Faculty of Arts offers a programme of study that leads to the degrees of Bachelor of Music and Master of Music.

There are three Schools in the Faculty of Arts: Home Economics, Librarianship, Social Work. They offer programmes of study that lead to the degrees of Bachelor of Home Economics, Bachelor of Library Science and Master of Social Work.

ORGANIZATION

I. The Division of the Humanities includes the Departments of

Asian Studies
Classics
English
German
History
Philosophy
Religious Studies
Romance Studies
Slavonic Studies

II. The Division of the Social Sciences includes the Departments of

Anthropology and Sociology
Economics
Geography
Political Science
Psychology

III. The Division of the Creative and Performing Arts includes the Departments of

Creative Writing
Fine Arts
Music
Theatre

IV. The three Schools are

Home Economics
Librarianship
Social Work

THE DEGREE OF BACHELOR OF ARTS

I. General description of the requirements of the Faculty:

A student who enters the Faculty of Arts lays the foundation for his education by taking fifteen units of work in his first year and fifteen units of work in his second year.

At the beginning of his third year he enters one of the two programmes of study that lead to the degree of Bachelor of Arts:

The *Major Programme* (thirty additional units of work)

OR

The *Honours Programme* (thirty-six additional units of work)

If he chooses the *Major Programme*, he will take fifteen units of work in each of his last two years; if he is admitted to the *Honours Programme*, he will take eighteen units of work in each of his last two years.

NOTE: In the academic year 1966-67, a third-year student should, if possible, follow the new requirements described in this calendar. A fourth-year student may elect to meet the requirements that were in effect when he entered the University, or he may elect to meet the new requirements. He may not elect a combination of old and new requirements.

II. Detailed description of the requirements of the Faculty:

REQUIREMENT IN SCIENCE

To qualify for the degree of Bachelor of Arts a student must complete satisfactorily a three-unit course in science or a course in mathematics or Geography 101. This requirement may be met in any one of the four years.

Geophysics 310, which has no prerequisite, was designed especially for students in the Faculty of Arts; it may be taken in the Third or Fourth Year.

FIRST YEAR

- | | |
|--|-----------------------|
| 1. English 100 | } (100-level courses) |
| 2. Foreign Language (100-level course) | |
| 3. Elective | |
| 4. Elective | |
| 5. Elective | |

Courses 2, 3, 4 and 5 must be chosen from List A.

LIST A

- | | |
|--|---|
| Asian Studies 100, 101 | Latin 100, 110 or 120 |
| Biology 101 | Mathematics 110 or 120 |
| Chemistry 101 or 102 or 110 | Music 100, 107, 120 |
| Economics 100, 101 (also listed
as Political Science 101) | Philosophy 100 |
| Fine Arts 125, 126 | Physics 103 or 110 or 120 |
| French 110 or 120 | Polish 110 |
| Geography 100, 101 | Political Science 101 (also
listed as Economics 101) |
| Geology 105 | Psychology 100 |
| German 100, 110 or 120 or 130 | Russian 100 |
| Greek 100 | Spanish 100 |
| History 100 | Theatre 120 |
| Italian 100 | |

SECOND YEAR

1. English 200
2. Foreign language (200-level course)
3. Elective
4. Elective
5. Elective

Courses 2, 3, 4 and 5 must be chosen from List A and List B.

LIST B

Anthropology 200, 206	Italian 200
Asian Studies 200, 201, 205, 206, 215	Latin 200, 210 or 220
Biology 234, 240	Mathematics 200, 201, 202, 205, 220, 221, 240
Botany 302, 303, 304, 305	Microbiology 200
Chemistry 200, 203, 205, 230	Music 200, 207
*Classical Studies 315, 316, 331	Philosophy 200, 212
Commerce 151	Physics 200, 204, 206
Creative Writing 201, 202	Polish 210
Economics 200, 202, 304, 320, 321	Political Science 200, 201, 204
English 200	Psychology 200, 206
Fine Arts 228, 326, 330	Religious Studies 200, 205
French 210 or 220, 223	Russian 200
Geography 201	Slavonic Studies 205
Geology 204, 210	Sociology 200
Geophysics 200	Spanish 200
German 200, 210 or 223	Theatre 300
Greek 200, 325	Zoology 202
History 201, 202, 204, 205, 206, 212	

*A knowledge of Greek and Latin is not required.

THE LAST TWO YEARS

At the beginning of the Third Year a student must enter

The *Major Programme*, which requires a measure of specialization. In this programme students must take, during their third and fourth years, fifteen units of work in courses numbered 300 and above in one subject or in one field of concentration. In the *Major Programme* the degree of Bachelor of Arts will be conferred when sixty units of work, approved by the Faculty of Arts, have been completed. Thirty of these units must be taken in the Third and Fourth Years.

OR

The *Honours Programme*, which requires intensive work in one subject or in one field of concentration. This programme is designed by the Department that offers it and is open only to students who, in the opinion of the Department, have shown special aptitude and would profit from it. In the *Honours Programme* the degree of Bachelor of

Arts, with First or Second Class Honours, will be conferred when sixty-six units of work, approved by the Faculty of Arts, have been completed.

Requirements common to the Major Programme and the Honours Programme:

- (i) In the Third and Fourth Years at least six units in courses outside the student's field of concentration must be successfully completed.
- (ii) A student will receive credit in the Third and Fourth Years for no more than six units in courses numbered 100 and 200.

THIRD YEAR

On entering the *Major Programme* or the *Honours Programme* a student must draw up a plan of study for the Third and Fourth Years in consultation with a departmental adviser.

Typical Major Programme:

1. Course in Major subject.
2. Course in Major subject.
3. Elective course outside field of concentration.
4. Elective.
5. Elective.

For the *Honours Programme* consult the Department that offers it.

FOURTH YEAR

At the beginning of the Fourth Year a student must have his programme of study reviewed by a departmental adviser.

Typical Major Programme:

1. Course in Major subject.
2. Course in Major subject.
3. Course in Major subject.
4. Elective course outside field of concentration.
5. Elective.

For the *Honours Programme* consult the Department that offers it.

NOTE: A student in the *Major Programme* who plans to enter the secondary programme (fifth year) of the Faculty of Education, after obtaining the degree of Bachelor of Arts, should consult the calendar of the Faculty of Education or the office of the Secondary Division of the Faculty of Education.

SPECIAL PROGRAMMES

In addition to the *Major Programmes* and *Honours Programmes* described in this calendar, special *Major* or *Honours Programmes* can be arranged to permit students to do work in related fields, e.g., Latin and Italian, Economics and Mathematics, French and Philosophy. Consult the Department that offers either subject.

GUIDE FOR STUDENTS

In this section of the calendar an attempt is made to describe how some of the business of the Faculty of Arts is discharged. *What follows is not a set of immutable rules and regulations*; the Faculty decides academic questions as they arise and reserves the right to deal as it sees fit with the academic problems of individual students.

I. ENTERING THE FACULTY OF ARTS

Admission of Students Who Reside in the Province of British Columbia

Grade XII

.. An applicant must have taken and passed the *Academic or Technical Programme* of the Department of Education of the Province of British Columbia. He will be admitted if he

- a) is recommended by an accredited school
or
- b) obtains an average of not less than sixty per cent in a full set of Grade XII examinations
or
- c) is granted admission by the Committee on Admissions of the Faculty of Arts.

Grade XIII

An applicant who has completed Grade XIII, or its equivalent at another university or college, will be considered on his academic merit.

Admission of Students Who Do Not Reside in the Province of British Columbia

An applicant must have the equivalent of a Grade XIII education in the Province of British Columbia, present a certificate of Senior Matriculation and be eligible for admission to a university in his own province, state or country.

Advanced Standing

Credit will be allowed for subjects taken in Grade XIII in the Province of British Columbia if they are relevant to the applicant's programme of study and if

- a) no fewer than three subjects were passed at one session of Grade XIII examinations
or
- b) the applicant has taken and passed a full programme of five Grade XIII subjects.

Credit will be allowed for subjects taken in Grade XIII outside the Province of British Columbia if they are relevant to the applicant's programme of study and if the Faculty considers the level of instruction adequate and the mark obtained acceptable.

Credit will be granted, where appropriate, at the level of the First and Second Years for studies completed in a junior college. Such credit may not be applied above the Second Year, *i.e.*, after the student has earned thirty units towards his degree.

Registration

The *General Information Bulletin* of the University of British Columbia describes how to apply for admission and how to register.

Please note that

- a) Applications for admission to the Winter Session must reach the Office of the Registrar before the first day of August.
- b) Once registered, a student must report in person to the Office of the Registrar to make any change in his programme of study.
- c) A student may take only courses for which he has registered.
- d) When a student drops a course without obtaining permission to do so, a failing mark is recorded.
- e) All changes in a programme of study must be made before the end of the second week of lectures.

Fees

Consult the *General Information Bulletin* of the University of British Columbia for details about the assessment and payment of fees. Fees are subject to change without notice.

Full Course*

Fees for the Winter Session, in the amount of \$457.00, may be paid in September at the time of registration.

A student who prefers to settle his account term by term must pay \$243.00 in September at the time of registration, and \$214.00 in January on or before the first day of lectures of the second term. A student who chooses this method of payment should mail a cheque to the Office of Accounting with a note giving his name in full, registration number and current address.

Partial Course*

Fees for a partial course, which must be approved by the Faculty, are assessed at \$30.00 a unit.

*The fee for the Alma Mater Society is \$29.00 for a full course and is included in the fee of \$243.00 for the first term; for a partial course of six units or fewer the fee is \$19.00, for a partial course of seven units or more the fee is \$29.00.

Financial Help

Consult *Awards and Financial Assistance*, a bulletin published by the University of British Columbia.

II. LEAVING THE FACULTY OF ARTS

Withdrawal

A student who decides to withdraw must present a *statement of clearance*, signed by the Dean or his representative, to the Office of the Registrar. The Registrar will then grant him *Honourable Dismissal* and decide whether or not he is entitled to a refund of fees. The term *Honourable Dismissal* has nothing to do with academic standing. It simply means that, at the time of withdrawal, the student's account was clear and his conduct good.

The Senate of the University reserves the right to require any student to withdraw, at any time, if that is in the best interests of the student or of the University.

Graduation

Before the fifteenth day of March of his final year every candidate for a degree must make application to be graduated. The Office of the Registrar provides a form for the purpose.

Transcript of Academic Record

The transcript of academic record is a confidential document that shows the complete record of a student at the University of British Columbia. It is usually issued only at the request of the student himself.

On withdrawal or on graduation a student may obtain, for his own use, a transcript of academic record marked UNOFFICIAL.

At the request of a student, a transcript of his academic record marked OFFICIAL will be mailed to any university, agency or institution, or it can be handed to him in an envelope bearing the mention VALID ONLY IF THE SEAL IS UNBROKEN. A small charge is made for uttering and mailing a transcript of academic record.

III. SOJOURN IN THE FACULTY OF ARTS

The student is responsible for drawing up a programme of study that meets the requirements of the Faculty. He must consult an academic adviser but the responsibility for meeting the requirements is his.

In the Winter Session the usual programme of study is fifteen units of work.

A course credited to one year on the transcript of academic record cannot later be transferred to any other year.

Requirement of Residence

The student who enters the Faculty of Arts after completing Grade XII must spend four Winter Sessions at the University of British Columbia to qualify for a degree and the student who enters after completing Grade XIII three. Extra courses, taken with the permission of an academic adviser in the Winter Session or in the Summer Session, cannot be used to shorten the requirement of residence.

Some students (chiefly teachers in service) are permitted to pursue degrees largely by way of the Summer Session; these students are advised to attend at least one Winter Session, preferably that of the final year.

Students who transfer to the Faculty of Arts from other universities must take all their remaining work in the University of British Columbia, where the minimum requirement of residence is two Winter Sessions.

The maximum credit allowed for work done in one Summer Session is six units.

The maximum credit allowed for courses by correspondence or extra-session courses is three units in any academic year. Such courses may not be taken by a student who is registered, at the same time, for a programme of study at the University of British Columbia and the total credit for such courses may not exceed fifteen units.

Attendance

A student who cannot attend his classes should notify his instructors in writing.

Examinations

A student who misses an examination in December or in April should, as promptly as possible, mail a medical certificate to the University Health Service. If injury or illness did not cause the absence, he should write an explanation of the circumstances to the Dean.

When unusual circumstances arise and a student believes that it would be reasonable for the Faculty to make a concession or a special ruling in his favour, he should appeal in writing to the Dean.

The results of the sessional examinations that are held in April are mailed to students in their fourth year shortly before Congregation and to other students by mid-June.

Satisfactory Standing

Students who take fifteen or eighteen units of work and obtain not less than 50% in each course are declared to be in good standing. The Faculty places students in the following categories:

First Class means an average of 80% or higher;

Second Class means an average of 65 to 79%;

Pass means an average of 50 to 64%.

A student who takes fewer than nine units of work must obtain passing marks in all his courses or get credit for none.

A student who takes nine units or more of work during a Winter Session must obtain passing marks in at least three courses (nine units of work) or get credit for none.

A student may repeat, *only once*, any course for which he failed to obtain credit; but the restriction does not apply to English 100 and 200.

Unsatisfactory Standing

A student who receives failing marks in more than three units of work may not register in a higher year, except that a deficiency of six units is allowed in the Fourth Year. The Faculty may permit him to take a programme of study that includes the courses that he failed or it may recommend substitutes for them.

A student who, for academic reasons, was required to withdraw from another Faculty or another university may enter the Faculty of Arts only if, upon appeal to the Dean, he obtains written permission to register.

A student in the First Year who gets passing marks in fewer than six units of work may not return to the University to repeat the same programme of study. He may be re-admitted if he can show, at some later date, that he has completed the equivalent of First Year as a student at another institution.

A student in the First Year who gets passing marks in only nine units out of fifteen will be re-admitted on probation. If his work continues to be unsatisfactory he may, at any time during the Winter Session, be required to withdraw.

A student in any year who fails for the second time will be required to withdraw.

Supplemental Examinations

A student may be granted the privilege of *one* supplemental examination if he

- a) writes the sessional examinations in April, or the Summer Session examinations in August, and earns a mark of at least 40% in the subject concerned

and if he

- b) earns twelve units of credit in the Winter Session or three units of credit in the Summer Session. A student in his final year may be allowed the privilege of two supplementals if he is no more than six units short of graduation.

In the computation of the average of a student, a passed supplemental examination is calculated as 50%.

The fee for writing a supplemental examination at the University of British Columbia is \$7.50; it is \$10.00 for writing one in

Cranbrook

Dawson Creek

Kamloops

Kitimat

Ocean Falls

Penticton

Powell River

Prince George

Prince Rupert

Trail

Victoria

Whitehorse

The fee for writing a supplemental examination, by special arrangement, in some town or city not mentioned above is \$20.00.

Application for the privilege of a supplemental examination must be made by a student in the Winter Session before the end of the first week of July and by a student in the Summer Session before the end of the first week of September. The fee is payable when the application is made.

Re-reading of Sessional Examination Papers

A request for the re-reading of an examination paper must reach the Office of the Registrar before the end of the fourth week after marks have been announced. A student may not request the Faculty to re-read more than two examination papers (six units of work).

The fee for re-reading an examination paper is \$5.00, which will be refunded if the mark is raised.

PROGRAMMES AND COURSES

This part of the calendar describes the **Major Programme, Honours Programme** and the courses offered by each department of the Faculty of Arts. The following list will help you find the subjects that are offered.

Anthropology
Asian Studies
Chinese (see Asian Studies)
Classical Studies (see Classics)
Classics
Comparative Literature
Creative Writing
Economics
English
Fine Arts
French (see Romance Studies)
Geography
Geophysics (see the calendar of the Faculty of Science)
Greek (see Classics)
Hebrew (see Religious Studies)
History
International Relations
Italian (see Romance Studies)
Japanese (see Asian Studies)
Latin (see Classics)
Linguistics (see Classics)
Mathematics
Music (for the degree B.Mus. see pp. F91-F102)
Philosophy
Polish (see Slavonic Studies)
Political Science
Portuguese (see Romance Studies)
Psychology
Religious Studies
Romance Studies
Russian (see Slavonic Studies)
Slavonic Studies
Sociology
Spanish (see Romance Studies)
Theatre

The following courses may, under certain circumstances, be taken by an undergraduate in the Faculty of Arts:

Any course listed in the calendar of the Faculty of Science
Commerce 151, 371
Home Economics 210
Social Work 499

TERMS AND ABBREVIATIONS

Numbering of courses: In general the number of a course indicates the first year in which it may be taken: 100—first year; 200—second year; 300—third year. In many instances, however, courses numbered 400 may be taken by third-year students; if in doubt consult the departmental descriptions below. Courses numbered 300 that can be taken in the Second Year are included in List B above, p. F21.

Units of credit: Credits are described in units, shown in parentheses immediately following the course-number. Thus 200. (3) under Anthropology indicates that Anthropology 200 is a three-unit course.

Hours of instruction: The notations appearing in square brackets at the end of a course-description indicate the number of hours assigned each week, during both terms, to lectures (first digit) and to laboratory, discussion or tutorial sessions (second digit); e.g.:

[3-0; 3-0] — three lecture-hours each week, both terms.

[3-0; 3-2] — three lecture-hours each week, first term; three lecture-hours and two hours of laboratory, discussion or tutorial each week, second term.

Courses not offered during the current year: Some of the courses listed in this calendar will not be offered in the current year. Where possible, such courses have been marked with a cross (+), but there is no guarantee that a course not so marked will be given. If in doubt consult the department that lists the course.

Prerequisites: If work must be taken before a student is eligible to enter a course, such work is specified in the course-description, under the term prerequisite. Prerequisites are described just before the list of "courses offered."

Graduate courses: At the end of each departmental description appears a list of graduate courses. For more complete information about these courses, which are usually open only to graduate students, see the *Calendar of the Faculty of Graduate Studies*.

ANTHROPOLOGY

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Second Year:

Anthropology 200

Third and Fourth Years:

Anthropology 300

12 units including at least 6 in courses numbered 400 or above

Honours

First and Second Years:

First or Second Class standing in Anthropology 200

A reading knowledge of a modern language

Third and Fourth Years:

18 units comprising a major in Anthropology

A thesis of 3 units

A seminar

One further course or seminar in Anthropology

Within the Honours Programme the student will concentrate on one of the following divisions of anthropology: archaeology, ethnology, cultural or social anthropology.

Courses in Sociology and some courses offered by other departments may be counted for credit in Anthropology provided the student has passed Anthropology 200 and 300.

Anthropology 200 is prerequisite to all third and fourth year courses except 412. Anthropology 300 is required for all third and fourth year courses except 412 but may be taken concurrently with those numbered between 301 and 399.

Honours students in Fine Arts may enrol in Anthropology 331 even if they have not taken Anthropology 200.

Courses Offered:

200. (3) Introduction to Anthropology.—A comparative study of cultural institutions in the primitive world; of family and other social structures; of economics, government, language, art, religion; of the origins of man and culture, the races of mankind and the nature of race. [3-0; 3-0]

300. (3) Social Organization.—The structure and organization of society; the individual and society; kinship; the social frame of economy, religion and art; social control and political institutions. [3-0; 3-0]

301. (3) Indians of British Columbia.—Native cultures of British Columbia; a survey of the native peoples of the New World; racial, linguistic and cultural relationships; intensive study of a few representative tribes. [3-0; 3-0]

302. (1½-3) Comparative Ethnography of Special Areas.—A specialized study of ethnographic and theoretical problems. A different region will be selected each term. [3-0; 3-0]

320. (3) Prehistory of the Old World.—Early man and cultural beginnings; the Mesolithic; the subsistence-revolution of the Neolithic; the rise of urban societies and the first civilizations. [3-0; 3-0]

331. (3) Art and Myth in Society.—The social and technological basis of art; theories of origin, development and interpretation. Major plastic and graphic arts, mythology, music and dance of tribal and early societies. [3-0; 3-0]

400. (3) Readings in Theory.—The principles used in the analysis of culture; the history of anthropological thought and the points of view represented in the classical monographs. [3-0; 3-0]

402. (1½-3) Comparative Ethnography of Special Areas.—An advanced study of ethnographic and theoretical problems. A different region will be studied each term. [3-0; 3-0]

405. (3) Kinship.—The significance of kinship. Typology of marriage, family and systems of kinship. Regulation marriage. Kinship behaviour and terminology. Ecology and evolution of kinship. [3-0; 3-0]

412. (3) **Introduction to Anthropological Problems.**—A comparative review of thought, values and institutions, using primarily tribal and folk materials. Some findings and applications of anthropology. *The course is intended for graduate students and students in their fourth year who have taken no other course in Anthropology.* [3-0; 3-0]

420. (3) **Archaeology of British Columbia.**—The prehistory of the Pacific Northwest and archaeological field work in this area. Students will participate in excavations at prehistoric sites near Vancouver and will receive instruction in techniques of research and in the interpretation of archaeological data. [2-3; 2-3]

430. (3) **Theory and Programmes of Social Change.**—General theory of cultural evolution and social change. Changes among the tribal and folk peoples. Programmes of welfare and development. [3-0; 3-0]

441. (3) **Honours Seminar.**—Open only to graduate students and Honours students in their fourth year.

449. (3) **Honours Essay.**

Graduate Courses:

- 500. (1-3) **Advanced Theory.**
- 501. (1-3) **Social Structure and Kinship.**
- 502. (1-3) **Advanced Ethnography of a Special Area.**
- 503. (1-3) **Social Control.**
- 504. (1-3) **Tribal and Peasant Economic Systems.**
- 505. (1-3) **Religion and Society.**
- 511. (1-3) **Personality and Culture.**
- 512. (1-3) **Language and Culture.**
- 520. (1-3) **Advanced Prehistory of a Special Area.**
- 530. (1-3) **Social Change.**
- 531. (1-3) **The Anthropology of Development.**
- 532. (1-3) **Field Methods.**
- 534. (1-3) **Special Advanced Courses.**
- 540. (3) **Advanced Seminar.**
- 549. (3-6) **Master's Thesis.**
- 649. **Ph.D. Thesis.**

ASIAN STUDIES

The Department offers programmes of study that lead to the degrees of M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Second Year:

Asian Studies 205, 206 or 215

Third and Fourth Years:

15 units in courses numbered 300 or above

Major in Chinese

First and Second Years:

Two courses in the Chinese language

Third and Fourth Years:

9 to 12 units in courses in language or literature numbered 300 and above

3 to 6 units in other courses in Asian Studies numbered 300 and above

Major in Japanese

First and Second Years:

Two courses in the Japanese language

Third and Fourth Years:

9 units in courses in language or literature numbered 300 and above

6 units in other courses in Asian Studies numbered 300 and above

Honours

Admission:

First or Second Class Standing in Asian Studies 205, 206, or 215.

Students who intend to specialize in East Asia must have obtained a First or Second Class in Asian Studies 100 or 101

Students who intend to specialize in South or Southeast Asia must be able to read French or another foreign language

Third and Fourth Years:

Four required courses: Asian Studies 440, 442, 449 (Honours students specializing in Asian History will usually take History 333)

Six courses from Asian Studies or from courses acceptable for credit in Asian Studies

Students who intend to specialize in East Asia must take at least two courses in Japanese or Chinese among the six courses

Note: Students intending to take a major or Honours in Asian History are advised to take History 100.

The following courses will be accepted for credit in Asian Studies, but only one will count towards a major:

Anthropology 402: Ethnography of a Special Area (Asia).

Anthropology 430: Social Change.

Fine Arts 426: Chinese Art.

Fine Arts 427: Japanese Art.

Fine Arts 429: Indian and Indonesian Art.

Geography 406: Geography of East Asia.

History 332 and 432: Major Powers in World Politics.

Political Science 303: East Asian Government.

Political Science 406: Contemporary East Asian International Relations.

- Philosophy 325: Chinese Philosophy.
 Religious Studies 300: Religious Thought of India.
 Religious Studies 302: Buddhism.
 Religious Studies 412: Mahayana Buddhism.

Courses Offered:

100. (4½) **Basic Japanese.**—An outline of the grammar and syntax of the spoken language together with an introduction to the Japanese script. [5-2; 5-2]
101. (4½) **Basic Chinese.**—An introduction to the grammar and syntax of spoken and written Chinese. [5-2; 5-2]
200. (4½) **Intermediate Japanese.**—Prerequisite: Asian Studies 100 or equivalent. [5-2; 5-2]
201. (4½) **Intermediate Chinese.**—Special emphasis on the grammar and syntax of modern Chinese. Readings selected from prose masters and official documents. Prerequisite: Asian Studies 101 or equivalent. [5-2; 5-2]
205. (3) **Introduction to East Asia.**—Geographical, ethnic and historical backgrounds of China, Japan and Korea. Survey of twentieth-century East Asian history. No prerequisite. [3-0; 3-0]
206. (3) **Introduction to Southeast Asia.**—Geographical, cultural, and historical backgrounds of Indonesia, Malaysia, Burma, Thailand, Cambodia, Laos, Vietnam and the Philippines. Problems of nationalism, foreign policy, economic and social development since 1941. No prerequisite.
215. (3) **Civilizations of Southern Asia.**—A survey of ancient and modern civilizations in India and other regions of Southern Asia; their political, social and intellectual evolution. No prerequisite. [3-0; 3-0]
300. (3) **Advanced Japanese.**—Readings in modern Japanese prose. [3-0; 3-0]
301. (3) **Advanced Modern Chinese.**—Modern Chinese (spoken and written) with emphasis on readings of contemporary literature and newspapers. Prerequisite: Asian Studies 201 or its equivalent. [3-0; 3-0]
302. (3) **Chinese Literature in Translation.**—An introduction to Chinese literature from ancient times to the present. [3-0; 3-0]
303. (3) **Classical Chinese.**—Readings in Chinese literary and historical works. Prerequisite: Asian Studies 201 or equivalent. [3-0; 3-0]
310. (3) **Far Eastern Diplomatic History, 1840-1945.**—A survey of the international relations of East and Southeast Asia. [3-0; 3-0]
320. (3) **History of China.**—A survey of Chinese history and culture from ancient times to the end of the Empire (1911). [3-0; 3-0]
330. (3) **History of Japan.**—Japanese political, social and cultural history from the earliest times to 1900. [3-0; 3-0]
335. (3) **Japanese Literature in Translation.**—An introduction to Japanese literature from the earliest times to the present day. [3-0; 3-0]
345. (3) **Indian Literature in Translation.**—A survey of classical and modern literature in translation. [3-0; 3-0]

401. (3) **Fourth-Year Chinese.**—Advanced readings in classical Chinese literature. [3-0; 3-0]

402. (3) **Fourth-Year Japanese.**—Advanced readings in Japanese literature. [3-0; 3-0]

403. (3) **History of Japanese Literature.**—A systematic survey and analysis of Japanese literary genres. Selected readings and discussions. Prerequisite: three years of Japanese or equivalent. [3-0; 3-0]

404. (3) **History of Chinese Literature.**—A systematic survey and analysis of Chinese literary genres. Selected readings and discussions. Prerequisite: three years of Chinese or equivalent. [3-0; 3-0]

405. (3) **Communist Movements in Eastern Asia.**—A survey of the growth, organization, ideology and programmes of Communist Parties in East Asia since 1920, with special emphasis on the Chinese Communist movement and the Chinese People's Republic. [3-0; 3-0]

410. (3) **The History of India, 1526-1947.**—Interactions of Hindu and Muslim civilizations during the Mughal period, and the impact of British rule on traditional Indian society since the late eighteenth century. [2-1; 2-1]

417. (3) **Chinese Political Thought and Institutions.**—Chinese theories and practices of government and administration from earliest times to 1949. Prerequisite: Asian Studies 205. [3-0; 3-0]

420. (3) **Contemporary South Asia.**—Problems of modernization and external relations of India, Pakistan, Ceylon and Burma, since independence. [2-1; 2-1]

+422. (3) **Modern Japan.**—Intellectual, social, political and economic currents in Japan since the Meiji Restoration (1868). Not given in 1966-67. [3-0; 3-0]

423. (3) **Modern Chinese History Since 1840.**—Political, social and intellectual changes from the Opium War to 1949. [3-0; 3-0]

440. (3) **Honours Seminar.** [0-2; 0-2]

442. (3) **Readings in Asian History or Literature.**—For Honours students only.

449. (3) **Honours Essay.**

Graduate Courses:

509. (3) **Problems of Modernization in Eastern and Southern Asia.**

510. (3) **Readings in Chinese Literature and Linguistics.**

511. (3) **Readings in Japanese Literature.**

512. (3) **Seminar.**—Topics in Chinese History and Institutions.

513. (3) **Seminar on Problems of Japanese Intellectual History.**

514. (3) **Seminar on Problems of Indian History Since 1858.**

525. (3) **Seminar.**—Topics in Asian history or literature.

549. (3-6) **Master's Thesis.**

CLASSICS

The Department of Classics offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Classical Studies:

Classical Studies 331 (should be taken in the second year)

15 units of Classical Studies; for 6 of these, courses in Greek or Latin numbered above 300 may be substituted

Greek:

Classical Studies 331

12 units of Greek numbered above 300; for 3 of these, a course in Latin numbered above 300 or in Classical Studies may be substituted

Latin:

Classical Studies 331

12 units of Latin numbered above 300; for 3 of these, a course in Greek numbered above 300 or in Classical Studies may be substituted

Linguistics:

Completion of two years of a foreign language

15 units of Linguistics and cognate courses

Honours

Classics:

First and Second Years:

Latin 120 (or 110)

Latin 220 (or 210)

Two courses in Greek

Third and Fourth Years:

The programme will normally include Greek composition, Latin Composition, two or three courses in Greek authors, two or three courses in Latin authors and Classical Studies 331

Greek:

First and Second Years:

Two courses in Greek

Third and Fourth Years:

The programme will include courses in Greek authors, Greek 310 and 410 and Classical Studies 331; a reading knowledge of Latin (*i.e.*, satisfactory completion of Latin 120 or its equivalent) will be required.

Latin:*First Year:*

Latin 120 (or 110)

Second Year:

Latin 220 (or 210)

Third and Fourth Years:

The programme will include courses in Latin authors, Latin 310 and 410 and Classical Studies 331; a reading knowledge of Greek (*i.e.*, satisfactory completion of Greek 200) is highly recommended.

The Department is prepared to arrange Honours programmes in collaboration with other Departments (*e.g.*, Romance Studies, English).

(i) Courses in CLASSICAL STUDIES

A knowledge of the Greek and Latin languages is not required for any of the following courses, which are designed to present studies in the life, literature and thought of the Greek and Roman world. Courses 315, 316 and 331 may be taken by second-year students. The Department of History recognizes Courses 331, 333 and 433. Three units of credit in Fine Arts will be given for Course 431.

315. (3) **Greek Epic and Tragedy.**—Study, in translation, of the *Iliad*, the *Odyssey* and selected plays of Aeschylus, Sophocles and Euripides. [3-0; 3-0]

316. (3) **Latin Literature in Translation.**—A survey, covering comedy (Terence), didactic poetry (Lucretius), oratory (Cicero), epic (Vergil), lyric (Horace), society-verse (Ovid), tragedy (Seneca), history (Tacitus), satire (Juvenal), epigram (Martial) and the novel (Apuleius). [3-0; 3-0]

+330. (3) **The Archaeology of Italy and the Roman Empire.**—A study of important sites in Italy and certain provinces of the Roman Empire, intended to illustrate the significance of archaeological research for the history and art of ancient Rome. Open to advanced undergraduates and to graduate students. [2-0; 2-0]

331. (3) **Ancient History.**—The rise of the Greek city-states; special emphasis on the political, economic and cultural achievements of the fifth and fourth centuries B.C.; the growth of Rome and the development of her political institutions during the Republic; the social and economic history of the Empire; the transition from the classical to the mediaeval world. No pre-requisite. [3-0; 3-0]

332. (3) **The Art of the Etruscans and the Romans.**—A survey of the art of the Etruscans and the Romans to the end of the reign of Constantine; the development of sculpture, wall-decoration and architecture; the spread and adaptation of Roman forms in the provinces of the Empire. Open to advanced undergraduates and to graduate students. [2-0; 2-0]

+333. (3) **The Roman Empire.**—A detailed study of Roman imperial history from 30 B.C. to the end of the fourth century. A conspectus of the political theory and practice of the classical Greek world and of the Roman Republic.

Attention will be directed to the development of Christianity and to the problem of Church and State. Prerequisite: Classical Studies 331 or permission.

[2-0; 2-0]

430. (3) **Classical Archaeology.**—A study of certain major contributions made by archaeological research to the history and art of pre-historic and classical Greece; attention will be paid to archaeological method and to the history of archaeological investigation. Open to advanced undergraduates and to graduate students.

[0-2; 0-2]

+431. (3) **Art of Pre-historic and Classical Greece.**—Study of the art of pre-historic and classical Greece; special attention will be paid to the development of vase-painting, sculpture and architecture. Open to advanced undergraduates and graduate students. Included in the programmes for Honours and a major in Fine Arts.

[0-2; 0-2]

433. (3) **Greece.**—A detailed study, in discussion, of the Greek city-states, their political and cultural evolution, their decline and their permanent contribution to western civilization. Historiography and historical method will be important objects of study. Emphasis in reading and discussion will be placed upon the ancient source-materials. Prerequisite: Classical Studies 331 or permission.

[0-2; 0-2]

(ii) Courses in GREEK

100. (3) **Beginners' Greek.**—The elements of Attic Greek. [4-0; 4-0]

200. (3) **Introduction to Greek Prose Authors.**—Prerequisite: Greek 100 or equivalent. [4-0; 4-0]

301. (3) **Greek Literature of the Classical Period.**—Plato's *Apology*; a play of Aeschylus; brief survey of Greek literary history. Open to second-year students. Prerequisite: Greek 200 or equivalent. [3-0; 3-0]

+303. (3) **Greek Drama.**—Development of Greek tragedy and comedy; scenic antiquities; representative plays. [3-0; 3-0]

+305. (3) **Epic Poetry.**—Selections from Homer's *Odyssey*. [3-0; 3-0]

306. (3) **Greek Historians.**—Greek historical writing; selections from Herodotus and Thucydides. [3-0; 3-0]

+309. (3) **Greek Oratory.**—The orations of Lysias and Demosthenes in their historical context. [3-0; 3-0]

310. (1½) **Composition.**—Obligatory for Honours students in the Third Year. [2-0; 2-0]

325. (3) **An Introduction to the Greek New Testament.**—Designed primarily for students specializing in Religious Studies. Open to students who have completed Greek 100 and to others only by permission of the Head of Department. This course does not satisfy the requirements in language nor may it be included in a major or an Honours programme in Greek, Latin or Classics. [3-0; 3-0]

406. (3) **Greek Comedy.**—The rise and development of Greek comic drama. [3-0; 3-0]

+407. (3) **Introduction to Greek Philosophy.**—Beginnings of Greek philosophic inquiry; selections from two of the major works of Plato and Aristotle. [3-0; 3-0]

410. (1½) **Advanced Composition.**—Obligatory for Honours students in the Fourth Year. [2-0; 2-0]

Graduate Courses:

- 521. (3) Aristotle's *Politics*.
- 522. (3) Homer and the Epic.
- 523. (3) Plato.
- 524. (3) The Tragic Poets.
- 525. (3) Thucydides.
- 535. (3) Problems in Greek History.
- 536. (3) The Monuments and Topography of Athens.
- 545. (3) Greek Epigraphy.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

(iii) **Courses in LATIN**

- 100. (3) **First Year Latin.**—For students with no previous knowledge of Latin. [4-0; 4-0]
- 110. (3) **Intermediate Latin, I.**—Prerequisite: Latin 20. [4-0; 4-0]
- 120. (3) **Latin Language and Literature, I.**—Prerequisite: Latin 12 (92). Reading of an anthology of Latin prose and poetry; prose composition. [3-0; 3-0]
- 200. (3) **Second Year Latin.**—Prerequisite: Latin 100. [4-0; 4-0]
- 210. (3) **Intermediate Latin, II.**—Prerequisite: Latin 110. Reading of an anthology of Latin prose and poetry; prose composition. [4-0; 4-0]
- 220. (3) **Latin Language and Literature, II.**—Prerequisite: Latin 120 or a First Class in Latin 110. Prose of Cicero; Horace's adaptations of the Greek Lyric; the developed Epic as represented by Vergil. [3-0; 3-0]

Composite Course in Latin (3).—Intended primarily for students attending the summer session. A substantial amount of a major Latin author (in 1966 Horace, *Odes*) will be read, partly in the original and partly in English translation, the amount of the original varying with the student's preparation. Students desiring credit in Latin 120, 200, 210, 220, 403, or 522, will register for this course under the appropriate number and will receive three units of credit upon the successful completion of the appropriate amount of work. Students registering for Latin 200 should have mastered the first five units of Ullman and Henry, *Second Latin Book*, or the equivalent.

- 310. (1½) **Composition.**—Obligatory for Honours students in the Third Year. [2-0; 2-0]
- +401. (3) **Philosophy.**—Lucretius and the philosophical writings of Cicero. [3-0; 3-0]
- +402. (3) **Drama.**—Plautus, Terence and Seneca. [3-0; 3-0]
- +403. (3) **Lyric and Elegy.**—Catullus, Horace and the elegiac poets. [3-0; 3-0]

404. (3) *Satire*.—Horace, Juvenal, Martial and Petronius. [3-0; 3-0]
 405. (3) *Epic Poetry*.—Vergil, *Aeneid*. [3-0; 3-0]
 +406. (3) *Latin Poetry*.—A survey of Latin poetry from the earliest native verse to late imperial and early Christian literature. [3-0; 3-0]
 +407. (3) *The Roman Historians*.—Livy, Tacitus and the *Letters* of Cicero. [3-0; 3-0]
 410. (1½) *Advanced Composition*.—Obligatory for Honours students in the Fourth Year. Prerequisite: Latin 310. [2-0; 2-0]
 425. (3) *Mediaeval Latin*.—An introduction to Latin literature of the Middle Ages, including a survey of the leading literary forms that existed between the Classical period and the Renaissance; mediaeval documents; the elements of mediaeval paleography. [3-0; 3-0]

Graduate Courses:

521. (3) *Cicero, Letters*.
 522. (3) *Roman Elegiac Poetry*.
 523. (3) *Roman Comedy*.
 530. (3) *The Roman Historians*.
 531. (3) *The Roman Epic*.
 535. (3) *Problems in Roman History*.
 549. (3-6) *Master's Thesis*.
 649. *Ph.D. Thesis*.

(iv) Courses in LINGUISTICS

300. (3) *General Linguistics*.—Introduction to structural linguistic analysis and description. Phonetics, phonology, morphology, grammar (syntax), meaning. Prerequisite: completion of a foreign language, ancient or modern, at the 200-level. [3-0; 3-0]
 319. (3) *Comparative and Historical Linguistics*.—The origin and nature of language; the development of the alphabet and other systems of writing; morphology and syntax; semantics; etymology; the classification of languages. [3-0; 3-0]
 320. (3) *Romance Linguistics*.—The Indo-European background; Classical and Vulgar Latin; the origin, development and spread of the Romance languages; their vocabulary, phonology, morphology, syntax; vernacular Latin texts and Romance texts. [3-0; 3-0]
 400. (3) *Phonology and Grammar*.—Theories of phonological, morphological and grammatical analysis and description; theories of linguistic meaning. Prerequisite: one of Linguistics 300, Linguistics 319, English 439. [3-0; 3-0]

COMPARATIVE LITERATURE

533. (3) *Epic Poetry*.—The nature and tradition of epic poetry, with particular emphasis on Homer, Vergil and Milton. Comparative studies will also be made of Beowulf, the *Chanson de Roland* and the *Nibelungenlied*.

For Seminar in Comparative Dramatic Literature, see Theatre 510, p. F89.

CREATIVE WRITING

The Department offers programmes of study that lead to the degrees of M.A. (in cooperation with the Department of English or the Department of Theatre) and B.A.

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Creative Writing 201 or 202

Third and Fourth Years:

15 units, chosen from upper-division courses in Creative Writing and related disciplines

Admission to Courses

Courses are restricted to fifteen students each. Applicants for Creative Writing 201 or 202 must prove their ability to write correctly and with imagination by submitting, before registration, an original work to be assessed by the Department. This work must be written in a genre listed in the description of the course for which the student applies and may be of any length and on any subject. Applicants for third and fourth year courses should have attained satisfactory standing in courses previously completed in Creative Writing.

Instruction

Instruction is carried on through workshops and individual conferences; attention is focussed on the student's writing. There are no examinations, and marks are based on the writing done and on participation in workshops throughout the year. The emphasis is on the contemporary and experimental, the artistic and professional, rather than on the commercial. Attention is also given to developing the student's ability to assess his own work and that of others.

Courses Offered:

201. (3) **Prose Techniques.**—Designed for beginning writers, including first-year students. Familiar essay, column, character-sketch, vignette, short-short story and the dramatic skit. [3-0; 3-0]

202. (3) **Creative Forms.**—Designed for beginning writers, excluding first-year students. Autobiographical essay, short story, shorter play forms (stage and radio) and lyrical and satirical verse. [3-0; 3-0]

†406. (3) **Writing of Plays for Radio, Screen and Television.**—With special permission of the instructor, some students may write stage-plays to satisfy requirements. Critical theories will also be examined and some studio work may be required. [3-0; 2-3]

407. (3) **Writing of Stage-Plays.**—With special permission of the instructor, some students may write plays for radio, television and screen to satisfy requirements. Critical theories will also be examined and some plays may be given workshop-production. [3-0; 2-3]

+408. (3) Writing of the Novella or Novel.—Critical theories will be examined. Open only to students who have shown ability in the writing of short stories or longer works of fiction. [3-0; 3-0]

409. (3) Writing of the Short Story.—Critical theories will be examined. [3-0; 3-0]

410. (3) Writing of Poetry.—Critical theories will be examined. [3-0; 3-0]

499. (3) Honours Essay.—Honours students in English who receive permission from the Departments of English and of Creative Writing to substitute a creative work for the Graduating Essay will register for Creative Writing 499 instead of English 499.

Graduate Courses:

507. (3) Writing of Drama.

509. (3) Writing of Fiction.

510. (3) Writing of Poetry.

547. (1-4) Directed Reading.

549. (3) Thesis.

ECONOMICS

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Mathematics 120

Economics 200 (or 202)

Economics 304 (may be taken in the Third Year)

Mathematics 240 is recommended

Third and Fourth Years:

Economics 300 (or 302)

Economics 320 or 321

9 units including at least 6 in courses numbered 400 or above

Honours

First and Second Years:

Mathematics 120

Economics 202 (or 200)

Economics 304 (may be taken in the Third Year)

Mathematics 240 is recommended

For admission to the Third Year:

First or Second Class in Economics 202 (or 200)

A reading knowledge of French (or an approved foreign language)

Third and Fourth Years:

21 units in Economics including

Economics 302 (or 300 with the approval of the Department)

Economics 320 or 321

Economics 308 or 400 or 415

Economics 441

Economics 449

Certain courses in other departments are also acceptable.

For admission to the Fourth Year:

First or Second Class in Economics 302 (or 300)

First or Second Class average in courses in Economics taken in the Third Year

Courses Offered:

Students who want to study Economics in their First Year are advised to take Economics 100 or 101 (Political Economy).

Economics 200 (or 202) is prerequisite to all courses with a higher number except Economics 304, 405 and 406.

100. (3) Economic History of Europe.—Influence of geographical factors, discoveries and inventions, religion, business and labour organizations and government on the economic development of civilizations from Ancient Greece and Rome to Western Europe in 1939. [3-0; 3-0]

101. (3) Political Economy.—Significant Canadian issues discussed from the political and economic points of view. Selected topics, including federalism, political parties, policies in the fields of welfare, unemployment and agriculture and Canada in the world community. This course is also listed as Political Science 101. [3-0; 3-0]

200. (3) Principles of Economics.—The institutions and processes involved in the production and distribution of wealth; basic determinants of prices and costs, the determinants of income and employment; international trade. [3-0; 3-0]

202. (3) Principles of Economics.—To be taken instead of Economics 200 by prospective Honours students; open to others by permission. Prerequisite: Second Class standing in the First Year. [3-0; 3-0]

300. (3) Intermediate Economic Analysis.—Theory of consumer-demand; production-theory; equilibrium of the firm; study of market-structures; monopoly, monopolistic competition and oligopoly; the social accounts; theory of income and employment; economic fluctuations; inflation; economic growth. [3-0; 3-0]

302. (3) Intermediate Economic Analysis.—To be taken instead of Economics 300 by Honours students; open to other students. Prerequisite: Second Class standing in Economics 200 or 202. [3-0; 3-0]

303. (3) History of Economic Thought.—The development of economic analysis from ancient to modern times, including some description of the changing environment in which economists wrote. Selections from the classics in the field from Aristotle to Keynes. [3-0; 3-0]

304. (3) Principles of Statistics.—Sources and presentation of data; measures of central tendency, dispersion, skewness and kurtosis; probability; sampling theory; estimation and tests of hypotheses; decision theory; simple regression and correlation analysis; Fortran programming; index numbers; analysis of classical time-series. Prerequisite: Mathematics 110 or 120. [3-2; 3-2]

306. (3) Economics of Labour and Industrial Relations.—Problems of labour in modern industrial society. History, structure and functions of trade unions and employer-organizations. Collective bargaining and industrial conflict. Procedures in settlements of disputes. [3-0; 3-0]

307. (3) Agricultural and Land Economics.—Production, prices and distribution of income in agriculture. Optimal use of resources with particular reference to agricultural and urban use of land; includes considerations of compensation, acquisition, tenure, financing; the effect of uncertainty, technological progress, urbanization and growth of population. [3-0; 3-0]

308. (3) Money and Banking.—Origins of money; the functions of banks; measures of purchasing power; determination of rates of interest; problems of monetary management; foreign exchange. [3-0; 3-0]

309. (3) Economics of Natural Resources.—Efficient management of natural resources; economic characteristics of the fishing, mineral, forest and water industries; effect of public policy on development of resources. [3-0; 3-0]

310. (3) Governmental Finance.—Role of government. Theories of justice in taxation. Characteristics of a good system of taxation. Governmental expenditures. Governmental revenues, with emphasis on income and property taxes and succession duties. Dominion-Provincial-Municipal financial relations. Governmental borrowing and fiscal policy. [3-0; 3-0]

311. (3) Market Structure and Public Policy.—Competitive behaviour of industries in contemporary economies; governmental policies for the prevention of restrictive practices. [3-0; 3-0]

313. (3) Analysis of Comparative Economic Organizations.—Economic analysis of allocation of resources. Capitalism and Marxian communism. Soviet economic planning in its various phases since 1917. Pre-war authorization economies. War-time controls and planning. The mechanics of industrialization. [3-0; 3-0]

314. (3) Transportation.—Function of transportation; transportation and economic development; demand, cost, pricing; coordination. Geographical, locational and urban studies. Public policy and current problems. [3-0; 3-0]

320. (3) Economic Development in Modern Europe.—Economic growth and development in Europe mainly since 1750. Empirical study of important changes in social and economic institutions; examination of their significance for structural change and the process of industrialization; analysis of growth, change and fluctuation in the major western economies until recent times. [3-0; 3-0]

321. (3) Economic History of Canada.—The growth of the Canadian economy in relation to development of natural resources, changing market conditions, industrialism, communications and technology. [3-0; 3-0]

400. (3) **Advanced Economic Analysis.**—Method; general and partial equilibrium; economics of welfare. Theories of money, capital and interest; distribution; economic growth. Prerequisite: Economics 300 or 302. [3-0; 3-0]

402. (3) **International Trade.**—Comparative costs and factor endowments; terms of trade; free trade vs. protection; monetary mechanism; gold vs. paper; internal vs. external stability; the transfer problem; capital movements. Prerequisite: Economics 300 or 302. [3-0; 3-0]

405. (3) **Intermediate Statistical Analysis.**—Probability; the binomial, Poisson, normal, t, chi-square and F distributions; tests of hypotheses and estimation; multiple regression and correlation analysis; index numbers, time series. Prerequisite: Economics 304 or Mathematics 205. [3-2; 3-2]

406. (3) **Industrial Statistics.**—Applications of sampling to industrial problems. Analysis of variance. Statistics of processes of production. Prerequisite: Economics 304 or Mathematics 205.

407. (3) **Economics of Labour.**—Determinants of wage-rates and employment in different types of labour markets. Impact of unions and collective bargaining on output, employment and prices at plant, industry, regional and national levels. Union policy and economic stability and growth. Economics of private and governmental programmes in welfare and security. Prerequisites: Economics 300 and 306. [3-0; 3-0]

412. (3) **Theory of Economic Development.**—Theories of economic development with application to advanced and underdeveloped economies; problems of carrying out developmental programmes. Prerequisite: Economics 300 or 302. [3-0; 3-0]

415. (3) **Mathematical Economics.**—Dynamic models; input-output models; the application of linear programming and the theory of games to economic analysis; general equilibrium models and the mathematics of marginal analysis. Prerequisite: Economics 300 or 302 and Mathematics 240 or 202 or 220. [3-0; 3-0]

441. (3) **Honours Seminar.**—Reports and group discussions of selected topics. Open only to Honours and graduate students. [2-0; 2-0]

449. (3) **Honours Essay.**—Essay on some theoretical or institutional problem.

Graduate Courses:

500. (3) **Economic Theory.**

502. (3) **International Trade.**

503. (3) **History of Economic Analysis.**

504. (3) **Applied Statistics and Econometrics.**

505. (3) **Sample Survey Methods and Theory.**

506. (3) **The Economics of Income Security.**

507. (3) **Economics of Labour.**

508. (3) **Money and Banking.**

509. (3) **Economic Analysis and Natural Resources.**

510. (3) **Governmental Finance.**

511. (3) Industrial Structure and Public Policy.
 512. (3) Economic Development.
 515. (3) Mathematical Economics.
 520. (3) Economic History.
 540. (3) Seminar.
 549. (1-6) Master's Thesis.
 600. (3) Topics in Economic Theory.
 604. (3) Advanced Econometrics.
 607. (3) Comparative Systems of Industrial Relations.
 608. (3) Banking Processes and Policies.
 649. Ph.D. Thesis.

ENGLISH

The Department offers programmes of studies that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Third and Fourth Years:

15 units in courses numbered 300 or above

Honours

Admission

First or Second Class in English 200

Third and Fourth Years:

18 units consisting of:

English 309 or 350

English 355

English 491 and 492 (Seminars)

English 496 and 497 (Reading Courses)

English 499 (Graduating essay; Creative Writing 499 may be substituted)

English 200 or its equivalent is prerequisite to all English courses numbered 300 or above.

Courses Offered:

100. (3) **Literature and Composition.**—A study of the principles of composition and of some twentieth-century examples of drama, short story, poetry and novel. Essays and exercises are required. [4-0; 4-0]

200. (3) **Literature and Composition.**—A study of literature from Chaucer to the nineteenth century, and of the principles of composition. Themes and exercises are required. Prerequisite: English 100. [3-0; 3-0]

303. (3) **English Composition.**—The principles and practice of good writing. For students in the Faculty of Education. [3-0; 3-0]

304. (3) **Advanced English Composition.**—Practice in the writing and criticism of essays. Open to students in the Faculty of Education and to others by permission. [3-0; 3-0]

309. (3) **Modern English and Its Background.**—A description of English phonetics, phonology, grammar and vocabulary. [3-0; 3-0]

310. (3) **Classics of European Literature.**—Aspects of the Western literary tradition from its beginnings to the twentieth century. Major representative texts in translation and their relevance to English literature. [3-0; 3-0]

311. (3) **Children's Literature.**—A survey of children's literature from early sources to recent books. The appraisal of books and authors for children. For credit in the Faculty of Education. [3-0; 3-0]

315. (3) **Literature of the Bible.**—Origins and backgrounds of biblical literature; the principal translations of the Bible into English; an examination of the chief literary forms of the Bible—poetry, drama, biography, short story, etc.; influence of the Bible on English language and literature. [3-0; 3-0]

320. (3) **History of Criticism.**—The imagination and the poetic process; the emotional element in poetry and the tests of value; the content of poetry and the nature of poetic truth; poetic form and its varieties, diction, imagery, tone-colour and metrics. [3-0; 3-0]

321. (3) **Approaches to Poetry.**—Critical studies of representative English poems grouped according to form and content. [3-0; 3-0]

+329. (3) **Modern Critical Theories.**—The problem of aesthetic value; the function of criticism. [3-0; 3-0]

331. (3) **The Drama to 1642.**—Development of English drama from the mediaeval period, with emphasis on major Elizabethan and Stuart playwrights. [3-0; 3-0]

332. (3) **British Drama, 1660-1880.**—Dramatic art from the Restoration to the late nineteenth century. [3-0; 3-0]

340. (3) **The English Novel.**—The major novelists of the eighteenth and nineteenth centuries. [3-0; 3-0]

350. (3) **Old English Literature and the Development of the Language.**—An elementary study of Old English language and literature and the history of the language up to modern English. [3-0; 3-0]

+354. (3) **A Survey of Middle English Literature.**

355. (3) **Chaucer.**—A detailed study of Chaucer's major works; his contemporaries and followers. [3-0; 3-0]

360. (3) **Sixteenth-Century Survey to 1611.**—The English Renaissance; its literature and some of its formative ideas. [3-0; 3-0]

365. (3) **Shakespeare.**—Lectures on various aspects of Shakespeare's art: detailed study of *Richard III*, *As You Like It*, *Twelfth Night*, *Julius Caesar*, *Othello*, *Macbeth*, *Coriolanus*, *The Tempest*. [3-0; 3-0]

366. (3) **Shakespeare.**—Lectures on various aspects of Shakespeare's art. Detailed study of *Romeo and Juliet*, *A Midsummer Night's Dream*, *The Merchant of Venice*, *Henry V*, *Measure for Measure*, *King Lear*, *Antony and Cleopatra*, *The Winter's Tale*. [3-0; 3-0]

370. (3) **Seventeenth-Century Literature.**—Prose and poetry, exclusive of Milton. Emphasis upon the ideas, forms and styles as an expression of the educational, religious, moral and political controversies of the age. [3-0; 3-0]

375. (3) **Milton.**—The work of Milton, with special emphasis on *Paradise Lost*. [3-0; 3-0]

380. (3) **Eighteenth-Century Literature.**—The age of Pope and the age of Johnson, including studies of representative authors such as Swift, Gray, Goldsmith, Burns and Blake. [3-0; 3-0]

389. (3) **Currents of Thought in Eighteenth-Century Literature.**—A close reading of works by Swift, Pope, Johnson and Sterne in conjunction with a study of aspects of the European Enlightenment. [3-0; 3-0]

390. (3) **A Survey of English Literature of the Nineteenth Century.**—The main movements of prose, poetry and drama. The Romantic Revival and romanticism as a continuing force. [3-0; 3-0]

391. (3) **The Romantic Period.**—Blake, Wordsworth, Coleridge, Byron, Shelley and Keats. [3-0; 3-0]

392. (3) **Victorian Poetry.**—Tennyson, Browning and Arnold. A few weeks are devoted to later poetry.

393. (3) **Victorian Prose.**—Macaulay, Carlyle, Mill, Newman, Ruskin, Arnold and Huxley. [3-0; 3-0]

395. (3) **Wordsworth.**—A study of the life and works of Wordsworth, with special emphasis on the *Prelude*. [3-0; 3-0]

420. (3) **Modern Period.**—Hardy, Hopkins, Butler, Wilde, Wells, Shaw and Conrad. The background of ideas and social forces, especially as revealed by the literature of the period 1870-1914. [3-0; 3-0]

425. (3) **British Drama, 1880 to the Present.**—A study of the movements and major dramatists in the late nineteenth and twentieth centuries. [3-0; 3-0]

429. (3) **Contemporary Literature.**—Major figures and trends in English literature between 1914 and 1960: Eliot, Yeats, Joyce, Lawrence, Woolf, Forster, Waugh, Orwell, Auden and Thomas. [3-0; 3-0]

440. (3) **Canadian Literature.**—A survey of the literature in English with some attention to major French-Canadian works in translation. [3-0; 3-0]

442. (3) **Literature of the Commonwealth.**—A comparative study of the traditions of English literature outside of England, particularly of the growth of indigenous literatures (in English) in the countries of the Commonwealth. [3-0; 3-0]

450. (3) **A Survey of American Literature.**—An examination of the main movements in American literature from Puritanism to the twentieth century. [3-0; 3-0]

451. (3) **American Poetry.**—A study of American Poetry with the main emphasis on poetry since Whitman. [3-0; 3-0]

454. (3) **American Fiction.**—A study of the major American novelists from Cooper to Faulkner. [3-0; 3-0]

Courses for Honours Students:

491. (1) **Introduction to Research and Critical Methods.** [1-0; 1-0]

492. (2) **Literary Criticism and Investigation.** [2-0; 2-0]

496. (3) Readings in English Literature. [3-0; 3-0]
 497. (3) Readings in English Literature. [3-0; 3-0]
 499. (3) Honours Essay.

Graduate Courses:

501. (0-3) **Bibliography and Methods.**—First term without credit; required of all graduate students lacking English 491 or equivalent.

- +503. (3) **Studies in Prose.**
 504. (3) **Studies in Drama.**
 505. (3) **Studies in Fiction.**
 506. (3) **Studies in Poetry.**
 507. (3) **Studies in Criticism.**
 +508. (3) **Studies in the History and Structure of the English Language.**
 510. (3) **Old English Studies.**
 +512. (3) **Middle English Studies.**
 +515. (3) **Shakespeare.**
 519. (3) **Studies in the Sixteenth Century.**
 520. (3) **Studies in the Seventeenth Century.**
 525. (3) **Studies in the Eighteenth Century.**
 530. (3) **Studies in the Romantic Period.**
 535. (3) **Studies in the Victorian Period.**
 539. (3) **Studies in the Twentieth Century.**
 540. (3) **Studies in American Literature to 1890.**
 545. (3) **Studies in American Literature Since 1890.**
 547. (3) **Directed reading in fields in which no courses are offered.**
 +548. (3) **Studies in Canadian Literature.**
 549. (3-6) **Master's thesis.**

With special permission from the Departments of English and Creative Writing (see Creative Writing) a student may offer a creative work in place of the thesis. See Creative Writing 549, in which such students should enrol.

649. Ph.D. Thesis.

FINE ARTS

The Department offers programmes of study that lead to the degrees of M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

- Fine Arts 125, 228
 Philosophy 100

Third and Fourth Years:

- 15 units of courses numbered 300 or above, selected from Fine Arts or from related approved courses

Honours*First and Second Years:*

Fine Arts 125, 228
Philosophy 100

Third and Fourth Years:

18 units of courses numbered 300 or above, selected from Fine Arts or from related approved courses, including
Fine Arts 439 (Bibliography)
One seminar
Fine Arts 449

An oral examination is given at the end of the Fourth Year. The student will be examined on his graduating essay and on any other aspect of his studies in Fine Arts.

Note: The following courses will be accepted for credit in the Major and Honours programmes:

Classical Studies 332 and 431
One of the following:
Anthropology 331
Architecture 305, 405, 425
Italian 310
Philosophy 400

Courses Offered:

125. (3) History of Art.—A survey of the history of architecture, sculpture and painting of the Western World from Ancient Egypt and Mesopotamia to the present. [3-0; 3-0]

126. (3) Introduction to Art.—Understanding and appreciation of traditional and contemporary forms for students who do not intend to take other courses in Fine Arts. [3-0; 3-0]

228. (3) Fundamentals of Design.—An intensive and advanced study of creative forms through experiments closely related to illustrated lectures and demonstrations; the basic visual elements of line, shape, volume, space, colour and texture, in various materials. Section 1 is for students planning to enter architecture; Section 2 for general students; Section 3 for students of the history of art. [1-6; 1-6]

352. (3) Mediaeval Art.—Byzantine and early Christian art; Romanesque and Gothic art and architecture. [3-0; 3-0]

326. (3) History of Oriental Art.—Illustrated lectures on the art of India, Indonesia, China and Japan. Open to second-year students. Fine Arts 326 is normally prerequisite to Fine Arts 426, 427 and 429. [3-0; 3-0]

327. (3) Art of North America.—A survey of the art of Canada, the United States of America and Mexico. [3-0; 3-0]

328. (3) Art and the Studio: Analysis of Techniques.—The materials and techniques of painting, with special reference to their development and historical importance. Prerequisites: Fine Arts 125 and 228. [3-0; 3-0]

330. (3) **Ancient Western Art.**—A survey of the art of Egypt, Mesopotamia, Greece and Rome. Open to second-year students. [3-0; 3-0]

331. (3) **Social History of Art.**—A study of the social, political, religious and economic background of the arts to account for changes of theme and style, from paleolithic times to the present. [3-0; 3-0]

425. (3) **History of Modern Art.**—A study of movements in Western Civilization from 1750 to the present. [3-0; 3-0]

426. (3) **Seminar in the History of Chinese Art.**—The principal influences and trends in Chinese art through the study of painting, architecture, sculpture, metal work or ceramics. Prerequisite: Fine Arts 326. [3-0; 3-0]

427. (3) **Seminar in the History of Japanese Art.**—Intensive study of various phases of Japanese Art. Prerequisite: Fine Arts 326. [3-0; 3-0]

428. (3) **Art and the Studio: Analysis of Style.**—A study of the stylistic characteristics of the old and modern masters, using studio techniques with library-material. Prerequisites: Fine Arts 125 and 228. Not to be taken concurrently with Fine Arts 328. [3-0; 3-0]

429. (3) **Indian and Indonesian Art.**—Concepts and problems in Indian painting, architecture or sculpture. Prerequisite: Fine Arts 326. [3-0; 3-0]

430. (3) **The Art of the European Renaissance.**—A survey and study of the painting, sculpture and architecture of Italy and Northern Europe from 1250 to 1600, with special emphasis on the period 1400 to 1550. [3-0; 3-0]

431. (3) **Art and Humanism: The Scientific Age, 1600-1960.**—A study of the human predicament in a world of inhuman forces, and their effect upon the arts. [3-0; 3-0]

432. (3) **European Art from 1600 to 1750.**—The painting, sculpture and architecture of the major European countries during the seventeenth and early eighteenth centuries, including Bernini, Poussin, Rubens, Rembrandt, Velasquez and Wren. [3-0; 3-0]

438. (3) **Theory and Practice of the Administration and Curatorship of Galleries.**—A theoretical and practical study of the nature and functioning of museums and galleries, covering their history, philosophies and general procedures. For fourth-year and graduate students who are thinking of becoming curators. [3-2; 3-2]

439. (3) **Bibliography and a Critical Study of the Literature of Art.**—Obligatory for Honours and graduate students. [3-0; 3-0]

449. (3) Honours Essay.

Graduate Courses:

525. (3) Seminar in the History of Art.

526. (3) Criticism of Art.

531. (1-3) Directed Study in the Visual Arts.

541. (1-3) Special Courses.

549. (3-6) Master's Thesis.

GEOGRAPHY

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Geography 101 and 201

Geography 212 (for majors in physical geography)

Third and Fourth Years:

15 units

Geography 445 is required for students planning to do graduate work

Honours

First and Second Years:

Geography 101 and 201

Mathematics 120

Two years of a modern language

Geography 212 (for physical geography)

Third and Fourth Years:

Geography 300 or 301

Geography 445

Geography 449

12 units in courses numbered 300 or above

Economics 304 or Mathematics 205 is advisable

Courses Offered:

100. (3) **The Geography of Culture and Environment.**—An introduction to the geographic analysis of reciprocal relationships of man, culture and environment. [2-1; 2-1]

101. (3) **Introduction to Physical Geography.**—Weather and climate; origin and distribution of landforms with particular reference to North America; map-projections. [3-2; 3-2]

201. (3) **Economic and Cultural Geography.**—Geographic aspects of cultural and economic change, resources, predominant economies; industrialization and urbanization. [3-1; 3-1]

202. (3) **Introduction to Weather and Climate.** (For students in the Faculty of Forestry only.)—Atmospheric elements, meteorological instruments and practical weather observations; classifications of climate; regional climatology with emphasis upon British Columbia. Throughout the course attention will be given to the relationship between climatology and forestry. [2-2; 2-2]

212. (3) **Principles of Climatology and Hydrology.**—Physical and descriptive climatology; measurement, classification, regional studies. Emphasis is placed on the hydrologic cycle and hydrometeorology in the second term. Pre-requisite: Geography 101. [2-2; 2-2]

A. Systematic Courses:

300. (3) **Field-Methods and Interpretation of Aerial Photographs.**—Field-methods of observing, recording and interpreting data. Aerial photography; measurement from aerial photographs; photo-interpretation in geographic analysis. Prerequisite: Geography 101 or Geology 105. [2-3; 2-3]

301. (3) **Cartography.**—Historical cartography, map-projections, methods of showing relief, aerial photographs, distribution-maps, statistical graphs and cartograms. Prerequisite: Geography 101 or Geology 105. [2-2; 2-2]

304. (3) **Rural Geography.**—Agriculture and settlement at various technological levels with emphasis on underdevelopment. Field-work in the Fraser Valley. Prerequisite: Geography 201. Limited to 40 students. [3-0; 3-0]

305. (3) **Geography of Urbanization.**—An analysis of the geographical aspects of the growth of cities in the western world stimulated by the industrial revolution and the emergence of an international economy; contemporary urban problems. Prerequisite: Geography 201. [2-1; 2-1]

306. (3) **Natural Resources and World Affairs.**—Selected aspects of economic geography: energy, soils; agricultural, mineral and forest raw materials and their significance in Canadian and world affairs. Laboratory on soils in the first term. Geography 101 and 201 are recommended but not required. [2-1; 2-1]

307. (3) **Political Geography.**—The viability of political regions in terms of the relationship between political process and territory. Selected political geographic problems such as discontinuity, partition, regional union, disputed areas, and boundary-change, illustrated by a variety of specific regional examples. Prerequisite: Geography 100 or 201. Open to Majors in History. [3-0; 3-0]

310. (3) **Geography of Manufacturing.**—World-distribution of manufacturing; selected manufacturing regions; distribution of selected manufacturing industries with emphasis upon primary processing. Prerequisite: Geography 201. [3-0; 3-0]

312. (3) **Physiographic Hydrology.**—The properties and spatial distribution of the physiographic regions of North America; the manner in which surface configuration influences the hydroclimatologic water-balance; factors of atmosphere and lithosphere relating to major hydrologic systems. Prerequisites: Geography 212. [2-2; 2-2]

412. (3) **Geomorphology.**—See Geology 412 in the Calendar of the Faculty of Science.

414. (3) **Regional Industrial Analysis.**—Application of quantitative methods of spatial analysis to selected problems, with emphasis upon industrial location, inter-regional flow of commodities and regional structure of economic development. Prerequisite: Geography 310. [3-0; 3-0]

451. (3) **Regional Urban Analysis.**—Application of theories of location and spatial organization to urbanization; functional structure of cities. Prerequisite: Geography 305. [2-1; 2-1]

B. Regional Courses

404. (3) **Geography of the Soviet Union.**—See Slavonic Studies 404.

405. (3) **Geography of Latin America.**—Pattern and change in Latin America, with detailed discussion of selected regions. Emphasis on developmental problems. Prerequisite: Geography 201. [2-1; 2-1]

406. (3) **Geography of East Asia.**—A regional survey of the physical and human geography of Eastern Asia with emphasis on China. [3-0; 3-0]

407. (3) **Historical Geography of North America.**—The geographical implications of the exploration, settlement and economic development of North America as expressions of regional variations in the process of social change and economic growth. Geography 201 and History 202 or 212 are recommended but not required. [2-1; 2-1]

408. (3) **Geography of Europe.**—A regional survey of Europe with special emphasis on the effects of traditional political fragmentation and of the current movement towards political integration. Geography 100 or 201 is recommended but not required. [3-0; 3-0]

409. (3) **Geography of Canada.**—Regional geography; landforms, climate, natural resources, population; primary industries. [3-0; 3-0]

410. (3) **Geography of the Pacific Northwest.**—Regional geography with emphasis on British Columbia and the Northwest States: physical and cultural elements, patterns, and problems of location and use of resources. Prerequisite: Geography 101; 201 is recommended. [3-0; 3-0]

420. (3) **Regional Geography of the United States.** [3-0; 3-0]

C. Courses Primarily for Honours Students.

445. (3) **Seminar.**—Current themes in geographical research; techniques and method; development of geographic thought. Required of Honours students. Open to fourth-year students and students of geography in the Faculty of Education. [1-2; 1-2]

449. (3) **Honours Essay.**

Graduate Courses:

Pro-Seminars

500. (1½) **Physical Geography.**

501. (1½) **Economic Geography.**

502. (1½) **Cultural Geography.**

503. (1½) **Political Geography.**

Courses and Seminars

510. (1½) **Cartographic and Quantitative Analysis.**

511. (1½) **Quantitative Methods in Earth Sciences.**

512. (1½) **Techniques of Spatial Analysis.**

513. (1½) **Sources for Regional Study.**

520. (1½) **Quantitative and Dynamic Geomorphology.**

521. (1½) **Permafrost.**

523. (1½) **Climatology and Hydrology.**

530. (1½) **Economic Geography.**

531. (1½) **Urban Geography.**

532. (1½) **Political Geography.**

533. (1½) **Marginal Settlement.**

- 534. (1½) Historical Geography.
- 538. (1½) History of Geographic Thought.
- 539. (1½) Contemporary Geographic Thought.
- 540. (1½-3) Geomorphology.
- 541. (1½-3) Manufacturing.
- 542. (1½-3) Urban Geography.
- 545. (1½-3) Canada.
- 546. (1½-3) The Western Arctic.
- 547. (1½-3) China.
- 548. (1½-3) U.S.S.R.
- 550. (1½-3) Directed Reading.
- 599. (3-6) M.A. Thesis.
- 699. Ph.D. Thesis.

GERMAN

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Second Year:

German 200 or 210

Third and Fourth Years:

German 223

15 units in courses numbered 300 or above, including:

German 310, 350, 407

Honours

Third and Fourth Years:

18 units in German courses numbered 300 and above, including:

one course in German history

one university-course in French, Italian, Spanish, Russian, Latin or Greek

a graduating essay (3-6 units)

Candidates will be required to take a comprehensive examination in the history of German literature.

Note: Students fluent in German take German 210 in the First Year and 310 or 350 in the Second.

Courses Offered:

100. (3) **First-Year German.**—Introduction to the language. [4-0; 4-0]
110. (3) **First-Year German.**—Review of grammar; extensive reading. Prerequisite: German 20 or German 91. [4-0; 4-0]
120. (3) **First-Year German.**—Grammar, composition, extensive reading. Prerequisite: German 92 or First Class in German 91. [4-0; 4-0]
200. (3) **Second-Year German.**—Reading, grammar, composition. Prerequisite: German 100. [3-1; 3-1]
210. (3) **Second-Year German.**—German language and literature. Prerequisite: German 110 or German 120 (Pass or Second Class). [3-0; 3-0]
223. (3) **Intermediate Composition and Oral Practice.**—Prerequisite: German 200 or 210 or First Class in German 120. [3-0; 3-0]
230. (3) **German for Students of Science.**—Prerequisite: German 91 or German 100. This is a terminal course and does not admit a student to more advanced courses. [4-0; 4-0]
310. (3) **German Literature 1700-1870.**—Major literary trends and representative figures from the Enlightenment to Naturalism.
323. (3) **Advanced Composition.**—Intensive training in translation, free composition and oral expression. [3-0; 3-0]
350. (3) **The Classical Period.**—Drama of the eighteenth century with emphasis on Goethe and Schiller. [3-0; 3-0]
400. (3) **Nineteenth-Century German Drama.**—The chief dramatic works of the period and their background. Special attention will be given to critical interpretation. [3-0; 3-0]
- +401. (3) **Twentieth-Century Drama.**—Representative dramas from Naturalism to the present with special emphasis upon the development of the dramatic medium against the background of a rapidly changing philosophical and social consciousness. [3-0; 3-0]
- +402. (3) **Middle High German.** [3-0; 3-0]
404. (3) **The Romantic Movement.**—A study of the literature of the period against the background of philosophical, political and social developments. [3-0; 3-0]
405. (3) **Trends in the Novel of the Nineteenth Century.**—A study of the novel through its most important stages of development from 1830 to 1900. [3-0; 3-0]
406. (3) **The Novelle.**—Development of the German Novelle with emphasis on the nineteenth century. Extensive independent reading will be expected. [3-0; 3-0]
407. (3) **Survey of German Literature to 1700.** [3-0; 3-0]
408. (3) **Baroque Literature.**—The literature of the seventeenth century. Special attention will be given to literary theories and the reflection in literature of changing patterns in society. [3-0; 3-0]
- +409. (3) **Eighteenth-Century Literature.**—A survey, with emphasis on Lessing and the *Sturm und Drang*. The political, social and philosophical background will receive close attention. [3-0; 3-0]

+410. (3) German Poetry from Goethe to Nietzsche.—The work of representative poets against the background of changing literary values. [3-0; 3-0]

411. (3) History of German Civilization.—Development of German culture from its beginnings to the nineteenth century. Lectures, discussions and term papers in German. This course is recommended for prospective teachers of German. Prerequisite: high standing in German 223. [3-0; 3-0]

412. (3) Twentieth-Century Poetry.—The lyric of the twentieth century with special emphasis on interpretation. [3-0; 3-0]

413. (3) The German Novel in the Twentieth Century.—The principal German novelists and the main developments in epic form between 1900 and the present day. [3-0; 3-0]

449. (3-6) Honours Essay.

Graduate Courses:

- 501. (3) Studies in the German Novel.
- 502. (3) History of the German Language.
- 503. (3) Seminar in Modern Authors.
- 504. (3) Studies in Mediaeval Literature.
- 505. (3) Studies in Expressionism.
- 506. (3) Old Icelandic.
- 507. (3) The German Essay from Lessing to Thomas Mann.
- 508. (3) Gothic and Comparative Germanic Linguistics.
- 509. (3) The Enlightenment.
- 510. (3) Studies in the Early Classical Period.
- 511. (3) Studies in the Later Classical Period.
- 512. (3) Studies in Romanticism.
- 513. (3) Seminar in Austrian Authors.
- 514. (3) Nineteenth-Century Realism.
- 515. (3) Contemporary Authors.
- 516. (3) Guided Research.
- 548. (1) Bibliography and Methods.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

HISTORY

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

First Year:

History 100

Second Year:

One field from among the following:

- American (History 205 or 212)
- Asian (Asian Studies 205, 206 or 215)
- British (History 201)
- Canadian (History 202 or 205)
- Commonwealth (History 201 or 205)
- Mediaeval, Renaissance and Reformation (History 204)
- Modern European (History 204)

Third and Fourth Years:

- 9 units in the field selected in the Second Year
- 6 units from the regular departmental courses numbered 300 or above, but outside the chosen field (without additional prerequisites), or from the list of courses acceptable for credit in History

Honours*First and Second Years:*

- First or Second Class in History 100
- One of History 201, 202, 204, 205, 206 and 212
- Reading knowledge of French or a foreign language appropriate to the field

Third Year:

- History 321 and 333
- 6 units in History
- 3 units outside the Department

Fourth Year:

- History 421, 433 and 449
- 3 units outside the Department
- A written comprehensive examination on two fields of specialization
- An oral examination on the graduating essay and the fields of specialization

Honours in History with International Relations*First Year:*

- History 100

Second Year:

- History 204 or 206 (formerly International Studies 100)
- Political Science 204 (formerly International Studies 200)
- Prerequisites for courses to be taken in the upper years

Third Year:

- History 321, 333
- 3 units in History
- 6 units selected from the following:
 - History 422, 423, 424
 - Political Science 301, 308, 403, 409, 410

Economics 313, 402, 412
 Anthropology 402, 430
 Asian Studies 310, 405, 420
 Slavonic Studies 440, 441
 Geography 307
 Sociology 421

Fourth Year:

History 421, 433 and 449
 One of History 332, 430 or 432
 A comprehensive written examination
 An oral examination on the graduating essay and the field of specialization

The following courses outside the Department may be counted toward the major:

One of:

Classical Studies 331 (Ancient History)
 Classical Studies 333 (The Roman Empire)
 Classical Studies 433 (Greece)

One of:

Asian Studies 310, 405, 417, 420
 Anthropology 430
 Economics 320, 321
 Greek 306
 Latin 407
 Political Science 300, 400, 406

Notes: Students who intend to major in History are advised to include in their programme some of the basic courses in the Social Sciences and the appropriate historical surveys of literature in the various departments of language, of thought in the departments of Philosophy, Religious Studies and Political Science, and of the arts in the departments of Fine Arts, Music and Theatre.

Courses Offered:

100. (3) **History of Modern Europe.**—An introduction to the period from the sixteenth century to the present day. This course is prerequisite for the major and Honours in History. (A different examination will be set for students of the Third and Fourth Years.) [2-1; 2-1]

201. (3) **England from the Fifth Century to 1509.**—A survey of the main themes of English History from the Anglo-Saxon settlements to the end of the Middle Ages. This course is prerequisite for field C and may be taken as prerequisite for field D. [3-0; 3-0]

202. (3) **History of Canada.**—Intended for students not planning to take Canadian History as their major field. It will be accepted as prerequisite to that field only when History 205 is not offered. [3-0; 3-0]

204. (3) **Europe from the Fifth to the Sixteenth Century.**—A survey of the main themes of European History from the fall of Rome to the Reformation. Prerequisite for fields A and B. [3-0; 3-0]

205. (3) **Europe in the Americas.**—A survey of European exploration and settlement of the Americas from the late fifteenth century to the early nineteenth century. Prerequisite for fields E and F; may be taken as prerequisite for field D. [3-0; 3-0]

206. (3) **Main Currents in Twentieth-Century History.**—A background for contemporary world-problems. Prerequisite for a combined major in International Relations. Not open to students who have received credit for History 101 or International Studies 100. [3-0; 3-0]

212. (3) **History of the United States of America.**—From colonial times to the present day. [3-0; 3-0]

A. Mediaeval, Renaissance and Reformation

(Prerequisite for Major: History 204)

304. (3) **Social and Economic History of the Middle Ages.** [3-0; 3-0]

313. (3) **The Renaissance.**—The Renaissance as a cultural movement. [3-0; 3-0]

316. (3) **Ideas and Institutions of the Middle Ages.** [3-0; 3-0]

413. (3) **The Reformation.**—Intellectual, social, political aspects of the religious developments. [3-0; 3-0]

416. (3) **France in the Middle Ages.**—The formation of the Kingdom of France to 1461. [3-0; 3-0]

History 306, 312 (field B) and 317 (field C) may also be taken in this field.

B. Modern European History

(Prerequisite for Major: History 204)

306. (3) **History of France, 1461-1715.**—The development of modern France to the climax of the monarchy under Louis XIV. [3-0; 3-0]

312. (3) **Russia from the Ninth Century to 1689.** [3-0; 3-0]

323. (3) **History of Russia.**—See Slavonic Studies 308. This course should precede History 405 if both are planned. [3-0; 3-0]

324. (3) **History of Non-Russian Eastern Europe.**—See Slavonic Studies 311. [3-0; 3-0]

325. (3) **German-Slav Relations from the Earliest Times to the Present.**—See Slavonic Studies 330. [3-0; 3-0]

331. (3) **Diplomatic History of Early Modern Europe.**—The relations of the European states from the Treaty of Westphalia to the establishment of the Bismarckian system. [3-0; 3-0]

332. (3) **Diplomacy of the Great Powers to 1939.** [3-0; 3-0]

400. (3) **Intellectual History of Modern Europe.** [3-0; 3-0]

405. (3) **History of Imperial Russia, 1689-1917.** [3-0; 3-0]

406. (3) **History of France, 1715-1939.**—Special attention will be given to the revolutions of the eighteenth and nineteenth centuries. [3-0; 3-0]

407. (3) **History of Modern Germany.**—The development of the main political, constitutional, economic and social events in Germany during the nineteenth and twentieth centuries. A reading knowledge of German is desirable. [3-0; 3-0]

408. (3) History of the Habsburg Monarchy, 1273-1918. [3-0; 3-0]

409. (3) The History of Italy, 1559-1918.—The development of modern Italy to the end of the First World War. [3-0; 3-0]

421. (3) History of Spain.—See Romance Studies (Spanish) 408. [3-0; 3-0]

423. (3) Nationalism and International Relations in Central and Eastern Europe.—See Slavonic Studies 448. [3-0; 3-0]

432. (3) Diplomacy of the Great Powers after 1939.—Major international problems since 1939. [3-0; 3-0]

History 313, 413 (field A), 318, 418, 419 (field C) and 305 (field D) may also be taken in this field.

C. British History

(Prerequisite for Major: History 201)

317. (3) Mediaeval English Institutions.—English institutional and constitutional development from the eleventh to the fifteenth centuries. [3-0; 3-0]

318. (3) England Under the Tudors and Stuarts, 1485-1688. [3-0; 3-0]

418. (3) Great Britain, 1688-1832. [2-1; 2-1]

419. (3) Great Britain Since 1832. [2-1; 2-1]

History 310 (field D) may also be taken in this field.

D. History of the Commonwealth

(Prerequisite for Major: History 201 or 205)

305. (3) Expansion of Europe: The Atlantic Area.—European colonization and colonial administration in North and South America, the West Indies and Africa. [3-0; 3-0]

310. (3) British Imperial History.—British colonial and imperial policy and ideas from the founding of the First British Empire to the present day. [3-0; 3-0]

311. (3) Expansion of Europe: Southeast Asia and the Pacific Area.—European exploration and commercial and colonial control in Southeast Asia and the Pacific Area. [3-0; 3-0]

411. (3) History of Australia, New Zealand and South Africa.—From the earliest settlements to the present day. [3-0; 3-0]

431. (3) Commonwealth and World Politics.—Evolution of the Commonwealth in the twentieth century and of the attitudes and contributions of independent countries of the Commonwealth to international security and cooperation from 1919 to the present. [3-0; 3-0]

History 419 (field C), 430 (field E), and 410 (field G) may also be taken in this field.

E. Canadian History

(Prerequisite for Major: History 205 or, if that is not offered, History 202)

326. (3) British North America, 1783-1867.—The economic, social, and political development of the British colonies in North America from the disruption of the First British Empire to Confederation. [3-0; 3-0]

329. (3) The Social Development of Canada.—The major themes in Canadian social development, with a consideration of the influences shaping them, from the era of New France to the present. [3-0; 3-0]

420. (3) **Evolution of the Canadian Constitution.**—With special emphasis on responsible government, federal union and federal-provincial relations.

[3-0; 3-0]

426. (3) **Canada After 1867.**—A survey of the main features of the political and economic development of Canada after 1867, with some consideration of foreign policy.

[3-0; 3-0]

430. (3) **Development of Canadian External Policy since Confederation.**—Except by special permission, registration is restricted to Honours students and majors in History.

[3-0; 3-0]

History 310 (field D) may also be taken in this field.

F. American History

(Prerequisite for Major: History 205 or, if that is not offered, History 212)

327. (3) **American Colonial and Revolutionary History.**—From the first establishment of the colonies to the ratification of the Constitution. [3-0; 3-0]

328. (3) **The United States, 1789-1877.**—Attention will be centred upon America's internal economy, society and politics, especially the Civil War.

[3-0; 3-0]

427. (3) **The United States since 1877.**—American political, economic and social development.

[3-0; 3-0]

428. (3) **Intellectual History of the United States from the Colonial Period to the Present Day.**

[3-0; 3-0]

429. (3) **History of the American West.**—Political, social and economic changes in the Trans-Mississippi West from 1800.

[3-0; 3-0]

G. Asian History

(Prerequisite for Major: Asian Studies 205, 206 or 215)

320. (3) **History of China.**—See Asian Studies 320.

330. (3) **History of Japan.**—See Asian Studies 330.

410. (3) **History of India, 1525-1947.**—See Asian Studies 410.

+422. (3) **Modern Japan.**—See Asian Studies 422.

424. (3) **Modern Chinese History Since 1840.**—See Asian Studies 423.

History 311 (field D) may also be taken in this field.

H. Honours Courses

(For Honours students only)

321. (6) **Tutorial in the First Field of Specialization.** [0-2; 0-2]

322. (6) **Tutorial in the Second Field of Specialization.** [0-2; 0-2]

333. (3) **Third-Year Honours Seminar.**—Bibliography, historical method and the philosophy of history. [0-2; 0-2]

421. (6) **Tutorial.** [0-2; 0-2]

433. (3) **Fourth-Year Honours Seminar.** [0-2; 0-2]

449. (6) **Honours Essay.** [0-2; 0-2]

Graduate Courses:

500. (3) **Readings in History.**

501. (6) **Seminar in Historiography.**

- 511-513. (6) Seminar in Mediaeval History.
- 517-519. (6) Seminar in Modern European History.
- 521-523. (6) Seminar in British History.
- 527-529. (6) Seminar in Imperial and Commonwealth History.
- 531-533. (6) Seminar in Canadian History.
- 537-539. (6) Seminar in American History.
- 541-543. (6) Seminar in Intellectual History.
- 549. (6) Master's Thesis.
- 649. Ph.D. Thesis.

PROGRAMME IN INTERNATIONAL RELATIONS

Students who want to do graduate work in International Relations should enrol in the special Honours programme in History (International Relations) or in Political Science (International Relations).

Requirements for the degree of Bachelor of Arts:

Major

First Year:

History 100

Second Year:

History 206

Political Science 204 (may be taken in Third Year)

One of Asian Studies 205, 206, 215 or Slavonic Studies 205 is recommended

Students who plan to concentrate in Economics in the Third and Fourth Years should take Economics 200 in Second Year

Third and Fourth Years:

15 units including one of Political Science 301, 308 or 403

One of History 332, 330 or 432

9 units from one or two of the following concentrations:

Economics

- Economics 313
- Economics 402
- Economics 412
- Anthropology 430

Soviet and Eastern Europe

- Slavonic Studies 340
- Slavonic Studies 412
- Slavonic Studies 440
- Slavonic Studies 441
- Slavonic Studies 448
- Political Science 408
- Political Science 409
- Geography 404
- History 405

Asian Relations

Anthropology 402
 (by permission)
 Anthropology 430
 Asian Studies 310
 Asian Studies 405
 Asian Studies 420
 Geography 406
 Political Science 406

General International Politics

Political Science 301
 Political Science 308
 Political Science 403
 Political Science 409
 Political Science 410
 History 331
 History 332
 History 407
 History 431 or 310
 History 430
 History 432
 Geography 307
 Anthropology 430
 Sociology 421

Note: Of the thirty units in Third and Fourth Years, at least six must be taken in courses other than Political Science and History.

MATHEMATICS

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A. For information about the degree of Bachelor of Science see the calendar of the Faculty of Science.

Requirements for the degree of Bachelor of Arts:**Major***First Year:*

Mathematics 120
 (Physics 103 or 110 or 120 is recommended)

Second Year:

Mathematics 200, 202

Third and Fourth Years:

Mathematics 300

12 units chosen from:

Mathematics 301, 302, 305, 306, 308, 410, 412, 419 and certain Honours courses by permission

Honours*Admission:*

Mathematics 120
 Physics 110 or 120

Second Year:

Mathematics 220, 221
 Physics 206

Third Year:

Mathematics 320, 321, 322

Fourth Year:

Option I: Mathematics 400, 401, 404

Option II: Mathematics 402, 404, 406

In each option, at least 3 units in Honours courses in Mathematics numbered 400 or above

For a description of the courses offered by the Department of Mathematics see the calendar of the Faculty of Science.

MUSIC

The Department offers programmes of study that lead to the degrees of M.Mus., B.Ed., B.Mus., B.A.

For a description of the programmes leading to the degrees of M.Mus. and B.Mus. see pp. F92-F103.

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Music 100 and 120 (concurrently)

Third and Fourth Years:

Music 200 and 320

3 units in a course numbered 300 or above

Honours

First and Second Years:

Music 100 and 120 (concurrently)

Music 200

Third and Fourth Years:

Music 300, 320, 449

9 units in courses numbered 300 or above

Courses Offered:

Note: For courses in Applied Music (which carry no credit toward the degree of Bachelor of Arts) see pp. F101-F102.

Theory and Composition

100. (3) **Theory of Music I.**—Melodic, harmonic, contrapuntal, rhythmic and formal elements in music. [3-2; 3-2]

107. (3) **Composition I.**—An introduction to musical composition. [3-0; 3-0]

200. (3) **Theory of Music II.**—A continuation of Music 100 with emphasis on larger forms, traditional harmony and free counterpoint. [3-2; 3-2]

207. (3) **Composition II.**—Continuation of Music 107. [3-0; 3-0]

300. (3) **Theory of Music III.**—A continuation of Music 200 with emphasis on extended tonality, contemporary idioms, large forms and linear counterpoint. [3-2; 3-2]
306. (2) **Conducting.**—Choral and instrumental conducting techniques and practices. This course carries credit only for majors in Music. [2-0; 2-0]
307. (3) **Composition III.**—Continuation of Music 207. [3-0; 3-0]
309. (2) **Orchestration.**—Orchestration and arranging for all instrumental and vocal ensembles. [2-0; 2-0]
400. (3) **Theory of Music IV.**—A continuation of Music 300 with emphasis on the detailed study of historical musical styles, past and present. [3-0; 3-0]

Graduate Courses:

500. (4) **Seminar in Analytical Techniques.**—Prerequisite: Music 400 or permission.
504. (3) **Twentieth-Century Practices.**—Prerequisite: Music 300.
506. (4) **Seminar in Conducting, Materials and Procedures.**—Prerequisite: Music 306.
509. (3) **Advanced Orchestration and Arranging.**—Prerequisite: Music 309.
549. (3) **Master's Thesis.**

History and Literature of Music

120. (3) **History of Music I.**—The development of music from Greece to *circa* 1600. [3-0; 3-0]
320. (3) **History of Music II.**—The development of music from *circa* 1600 to the present day. [3-0; 3-0]
321. (1) **Music Appreciation, Twentieth-Century.**—Designed for students with little or no musical background. Not open to majors in Music. *Second term only.* [0-0; 2-0]
322. (3) **Music and Civilization.**—Development of music in relation to the other arts, science, philosophy, literature and history. Designed for students not proceeding to the B.Mus. [3-0; 3-0]
323. (3) **Seventeenth- and Eighteenth-Century Music.**—Detailed study of assigned aspects of this period. Prerequisite: Music 320. [3-0; 3-0]
324. (3) **Nineteenth- and Twentieth-Century Music.**—Detailed study of assigned aspects of this period. Prerequisite: Music 320. [3-0; 3-0]
325. (3) **Literature for Strings, Woodwinds and Brasses.**—An examination of music for chamber and large ensembles. [3-0; 3-0]
326. (3) **Music Appreciation.**—Designed for students with no musical background. Not open to majors in Music. [3-0; 3-0]
420. (3) **History of Symphonic and Chamber Music.**—Study of music composed for the symphony orchestra and chamber ensembles. Prerequisite: Music 320. [3-0; 3-0]
422. (3) **History of Keyboard Music.**—Development of music for organ, harpsichord, clavichord and piano to the present day. Prerequisite: Music 320 or permission. [3-0; 3-0]

423. (3) **History of Opera.**—The development of opera to the present day. Prerequisite: Music 320 or permission. [3-0; 3-0]
424. (3) **History of Vocal Music.**—The development of solo song and choral music (including oratorio) to the present day. Prerequisite: Music 320 or permission. [3-0; 3-0]
425. (3) **Mediaeval and Renaissance Music.**—A detailed study of early notation and musical developments. Prerequisite: Music 120. [3-0; 3-0]
449. (3) **Graduating Essay.**

Graduate Courses:

520. (4) **Seminar in Musicology.**—Prerequisites: Music 320 and a course in musical history numbered 300 or above.
521. (3) **Seminar in Performance-Practices.**—Prerequisites: Music 320 and a course in musical history numbered 300 or above.
522. (3) **Seminar in Notation in Polyphonic Music.**—Prerequisites: Music 320 and a course in musical history numbered 300 or above. (Students who have completed Music 425 should not enrol in this course.)
523. (3) **Seminar in Mediaeval Music.**—Prerequisite: Music 425.
524. (3) **Seminar in Music of the Renaissance.**—Prerequisite: Music 425.
525. (3) **Seminar in Baroque Music.**—Prerequisite: Music 323.
526. (3) **Seminar in Eighteenth-Century Music.**—Detailed study and investigations of the development of eighteenth-century music in such centres as Mannheim and Vienna. Prerequisite: Music 323.
527. (3) **Seminar in Nineteenth-Century Music.**—Designated projects relating to nineteenth-century music developments. Prerequisite: Music 324.
528. (3) **Seminar in the Literature of Music.**—Students in graduate programmes involving performance will be given special projects related to the history, bibliography, repertoire and teaching problems in each area. A paper will be required. Prerequisites: Music 300 and 320.
549. (3) **Master's Thesis.**

PHILOSOPHY

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

First Year:

Philosophy 100

Second Year:

Philosophy 200

Third and Fourth Years:

Philosophy 301

Philosophy 302 or 303

3 units in Philosophy (not 410)

6 additional units

Honours*First and Second Years:*

Philosophy 100

Philosophy 200 (the Department will sometimes allow a prospective Honours student already in Second Year to omit Philosophy 100)

Third and Fourth Years:

Philosophy 302 or 402

15 units, including at least 6 units of tutorial work (in Philosophy 330 or 430)

There is a comprehensive examination at the end of the Fourth Year

Courses Offered:**Introductory Courses (no Prerequisites):**

100. (3) **Introduction to Philosophy.**—Some influential philosophical writing and doctrines, as an introduction to the problems and methods of Philosophy. [3-0; 3-2]

212. (3) **Logic and Scientific Reasoning.**—Introductory deductive logic; the grounds of empirical knowledge; scientific procedures and attitudes; practice in criticising arguments. Students who intend to do further work in philosophy, mathematics and science should take Philosophy 302 rather than 212. [3-0; 3-0]

410. (3) **Philosophical Problems.**—Problems of method, knowledge, metaphysics, values and social philosophy. Primarily for fourth-year and graduate students who have had no course in Philosophy. [3-0; 3-0]

414. (3) **Philosophy of Science.**—Topics of interest to fourth-year and graduate students in Science. No previous philosophical experience will be assumed, but extensive reading will be demanded. [3-0; 3-0]

424. (3) **Philosophy of Social Science.**—Topics in the philosophy of science of special concern to the social and behavioural sciences; hypotheses and explanation; principles, theories, models; the formation of scientific concepts; the function of mathematics in social science. [3-0; 3-0]

Second Year

200. (3) **Epistemology and Metaphysics.**—Topics in general philosophy: scepticism concerning the external world; mind-body problems; problems concerning perception; induction; free will. Readings in classical and contemporary texts. [3-0; 3-0]

Third and Fourth Years

301. (3) **Ethics.**—Problems in ethics, based on the reading of classical texts. [3-0; 3-0]

302. (3) **Deductive Logic.**—Introduction to symbolic logic. Topics include the logic of propositions and predicates, axiom-systems, and philosophical problems raised by the results of modern logic. Primarily for students in Philosophy, Mathematics and the Sciences. [3-0; 3-0]

303. (3) **History of Philosophy.**—Each year there will be an intensive study of a philosophy or group of philosophers important to the history of philosophy. [3-0; 3-0]

313. (3) **Mediaeval Philosophy.**—Western philosophic thought from Augustine to Ockham; survey of the main readings in Augustine, Boethius, Anselm, Aquinas, Scotus, Ockham. [3-0; 3-0]

317. (3) **Philosophy of Religion.**—An inquiry into the nature of religion; the origin of religious belief; the relations among faith, revelation and knowledge; the problem of freedom of the will; the nature of evil; and proofs of the existence of God. [3-0; 3-0]

323. (3) **Chinese Philosophy.**—Chinese philosophic thought from the Confucian period to the end of the Empire (1911); emphasis will be on the classical period. [3-0; 3-0]

400. (3) **Epistemology and Metaphysics.**—Advanced topics in philosophy. [3-0; 3-0]

401. (3) **Social and Political Philosophy.** [3-0; 3-0]

402. (3) **Symbolic Logic.**—Systematic development of deductive logic, the foundations of mathematics and meta-mathematics. [3-0; 3-0]

403. (3) **History of Philosophy.**—Each year there will be an intensive study of a philosopher or group of philosophers important to the history of philosophy. Normally open only to those students who have taken Philosophy 303. [3-0; 3-0]

411. (3) **Aesthetics.**—An analysis of the aesthetic experience and its relationship to beauty, the fine arts, literature, science and morality. [3-0; 3-0]

For Honours Students Only

330. (6-9) **Honours Tutorial, Third Year.** [0-1; 0-1]

430. (6-9) **Honours Tutorial, Fourth Year.** [0-1; 0-1]

449. (3) **Honours Essay.**

Graduate Courses:

500. (3) **Metaphysics and Epistemology.**

501. (3) **Moral Philosophy.**

502. (3) **Logic.**

503. (3) **Ancient Philosophy.**

505. (3) **Philosophy of Mathematics.**

506. (3) **Philosophy of Mind.**

511. (3) **Aesthetics.**

513. (3) **Mediaeval Philosophy.**

514. (3) **Philosophy of Science.**

521. (3) **Political Philosophy.**

524. (3) **Philosophy of Social Science.**

573. (3) **Plato.**

583. (3) **Aristotle.**

593. (3) **Kant.**

539. (3) Problems.
 549. (6) Master's Thesis.
 649. Ph.D. Thesis.

POLITICAL SCIENCE

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Either Political Science 200, or
 Political Science 101 and Political Science 201 or
 Political Science 201 and 401 (in Third or Fourth Year)

Third and Fourth Years:

Political Science 300
 12 units in courses numbered above 300

Honours

First and Second Years:

As for the Major
 First or Second Class in a course in Political Science

Third and Fourth Years:

Political Science 300, 301, 401, 449
 6 units of Political Science
 12 units in approved courses

Honours in Political Science with International Relations

Admission:

A reading knowledge of a modern foreign language
 First or Second Class in Political Science 204 (formerly International Studies 200)
 Political Science 200; or the combination of Political Science 101 and Political Science 201
 History 206
 History 100, Asian Studies 205, Slavonic Studies 205, Economics 200 are also recommended.

Third and Fourth Years:

36 units including
 Political Science 300 or 400, 301, 308, 441, 449, and 6 units in Political Science
 History 430
 Three of the following:
 Asian Studies 405, 417
 Economics 313, 402, 412

Anthropology 412, 430
 Geography 307
 History 332, 431, 432
 Psychology 308, 408
 Sociology 421

Courses Offered:

101. (3) Political Economy.—Significant Canadian issues discussed from the political and economic points of view. Selected topics: federalism, political parties, policies in the fields of welfare, unemployment and agriculture and Canada in the world community. This course is also listed as Economics 101. [3-0; 3-0]

200. (3) Democratic Government and Politics.—A comparative and analytical inquiry into the political institutions and processes of Canada, the United Kingdom and the United States. Prerequisite: first-year standing. [3-0; 3-0]

201. (3) Governments of Britain and the United States.—Prerequisite: first-year standing. [3-0; 3-0]

Note: Students may not normally take both Political Science 200 and 201.

204. (3) International Politics.—Comparison of historical international systems; the formulation of foreign policies, including ideological, perceptual and historic components. Strategies of isolation, non-alignment and alliance. Techniques of wielding international influence through diplomatic bargaining, propaganda, economic aid, subversion and war. Ethical and legal restraints on behaviour in foreign policy. [3-0; 3-0]

300. (3) History of Political Thought.—Evolution of political ideas and various basic concepts of government, such as the theory of the state, natural law, divine right of kings, social contract, sovereignty, political obligation and consent. [3-0; 3-0]

301. (3) Comparative Government.—The governments and politics of some of the following countries: France, Germany, Italy, the Netherlands, Belgium, Switzerland, the Scandinavian countries, the "People's Democracies" of East-ern Europe, the U.S.S.R. [3-0; 3-0]

302. (3) Public Administration.—The structure and organization of the administrative branch of government, in theory and practice. Illustrations are drawn from Canada, Great Britain and the United States. Administrative powers and administrative responsibility in the modern state. The personnel policies of modern governments; the agencies of control. Prerequisite: Political Science 200 or 201. [3-0; 3-0]

303. (3) East Asian National Politics.—A comparative survey of the political systems of East Asia. [3-0; 3-0]

304. (3) The Press and Politics.—An analysis of the role of the mass media in public affairs: sources of news and means of dissemination; the organizational structure of the contemporary press; the press and governmental policy; recent theories of the mass media. Prerequisite: Political Science 200 or 201. [3-0; 3-0]

305. (3) Political Parties and Electoral Systems.—A study of political parties, electoral systems and survey-techniques. Prerequisite: Political Science 200 or 201 or 301. [3-0; 3-0]

308. (3) International Organization Since 1919.—The political functions and constitutional development of universal and regional international organizations since the appearance of the League of Nations. The major focus of study is the United Nations. The problem of political integration will be studied with special emphasis on the E.E.C. [3-0; 3-0]

310. (3) Introduction to Political Behaviour.—The social, cultural and psychological contexts of political behaviour. Prerequisite: Political Science 200 or 201. [3-0; 3-0]

400. (3) Modern Political Theory.—Political doctrines from Hegel to the present day, including anarchism, utopian socialism, democratic socialism, democratic capitalism, Marxian socialism, Leninist and Stalinist communism, fascism. Conflict between democratic and totalitarian ways of life. Prerequisite: Political Science 300 or Philosophy 304. [3-0; 3-0]

401. (3) Canadian Government and Politics.—Federalism, political parties, parliamentary institutions, constitutional law and administrative arrangements in Canada. Prerequisite: Political Science 200 or 201 or 301. [3-0; 3-0]

403. (3) Public International Law.—The nature, sources and sanctions of international law; the notion of nationhood with particular reference to the status of the British Dominions; territorial and extra-territorial jurisdiction; diplomatic and sovereign immunities; international delinquency; treaties; settlement of disputes; international organizations. This course may not be taken for credit in both Arts and Law. [3-0; 3-0]

404. (3) Municipal Government.—A comparative study of local governmental institutions and processes in the English-speaking world, with special attention to Canada. [3-0; 3-0]

405 (3) Government in Multi-Ethnic Societies.—The governmental problems created by racial, linguistic, religious and national minorities. An analysis of the constitutional and political techniques used for the protection of such minorities. Prerequisites: Political Science 200 (or 201) and 301 or permission. [3-0; 3-0]

406. (3) Contemporary East Asian International Relations.—The external relations and the major foreign policies of states in Eastern Asia since World War II. [3-0; 3-0]

407. (3) American Politics and Government.—The social context of American politics, voting behaviour, legislative process, executive powers, executive-legislative relations, judicial behaviour and problems of policy: labour, commerce, civil rights, etc. Prerequisite: Political Science 200 or 201. [3-0; 3-0]

408. (3) Soviet and East European Politics.—Soviet government and institutions; ideological and structural changes since World War II. Soviet foreign policy. The theory of the "People's Democracy". The impact of the Soviet model on constitutions of the satellite countries and the various "roads to socialism". The Communist "Commonwealth"; ideology and power-relations among Communist states; transformation of the bloc. [3-0; 3-0]

409. (3) Comparative Foreign Policies.—A number of post-1945 case-studies, such as Berlin, Korea, Suez, Cuba, Vietnam, E.E.C., nuclear proliferation. Prerequisites: Political Science 204 (formerly International Studies 200) or 301. [3-0; 3-0]

410. (3) International Violence and Its Control.—History and theories of arms-control and disarmament: the defence-policies of the major powers and Canada; problems of military strategy confronting regional alliances. Studies

of international situations, including the causes of war; peace-keeping operations by international organizations. [3-0; 3-0]

412. (3) **Southeastern Asian Politics.**—The political systems of contemporary Southeastern Asia with major emphasis on the Philippines and Malaysia. [3-0; 3-0]

441. (3) **Honours Seminar.**—Reports and group-discussions of important aspects of political science. Open only to Honours and graduate students. [2-0; 2-0]

449. (3) **Honours Essay.**

Graduate Courses:

500. (3) **Political Theory.**

501. (3) **Seminar in Canadian Government and Politics.**

502. (3) **Public Administration.**

503. (3) **Techniques of Political Analysis and Research.**

504. (3) **Theory of International Relations.**

505. (3) **Political Parties and Political Movements.**

506. (3) **Models of the Political System.**

507. (3) **Comparative Western Government.**

508. (3) **Comparative Non-Western Governments.**

509. (3) **International Organization.**

510. (3) **Directed Studies.**

540. (3) **Master's Seminar.**

549. (3-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

PSYCHOLOGY

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Psychology 100 and 200

Third and Fourth Years:

One of Psychology 306, 307, 315, 406, 409

12 units in courses numbered 300 and above

Honours

First and Second Years:

Psychology 100 and 200

Mathematics 120

Biology 101

Third and Fourth Years:

A minimum of 18 units including:

- Psychology 306
- Psychology 315
- Psychology 410
- Psychology 449

Note: Psychology 200 is prerequisite to: Psychology 306, 307, 315, 403, 404, 405, 406, 408, 409, 410.

Psychology 200 or 206 is prerequisite to: Psychology 301, 305, 308, 311, 312, 400, 401, 415.

Third-year students may not take courses numbered 400 and above except where designated.

Courses offered:

100. (3) Introductory Psychology.—The basic forms of human behaviour including the motivational, sensory, mental, social, modifiable, emotional, adaptive, individual, personal and transitional nature of human activity.

[3-0; 3-0]

200. (3) Experimental Psychology.—The principles and methods of experimental psychology; use of elementary statistics in analysis of data; laboratory demonstrations and individual research-projects. Prerequisite: Psychology 100.

[2-3; 2-3]

206. (3) Dynamics of Behaviour.—An experimental, dynamic and social approach to behavioural adjustment with special reference to applications. Prerequisite: Psychology 100.

[3-0; 3-0]

301. (3) Developmental Psychology.—The psychological development of infants and children from birth to adolescence. Emphasis on intellectual and social developments and the development of personality.

[3-0; 3-0]

305. (3) Theory of Personality.—Approaches to the theory of personality, principal theoretical problems, theories of personality as represented by psychological systems.

[3-0; 3-0]

306. (3) Conditioning and Learning.—The theories and principles of classical and operant conditioning; illustrative emphasis on human learning. Each student is expected to design and execute a minor research-study.

[2-3; 2-3]

307. (3) Motivation and Emotion.—The principles and theories of motivation and emotion, including physiological and social processes, theoretical and experimental developments and influences on behavioural processes.

[3-0; 3-0]

308. (3) Social Psychology.—Social motivation and social perception, development and change of beliefs and attitudes, propaganda, inter-action in social groups, conformity, morale, leadership, and race-prejudice. Credit is not granted for both 308 and the former 201. For third-year students only.

[3-0; 3-0]

311. (3) Individual Differences.—The measurement, inter-relationships and patterning of human capacities and traits; the effects of sex, race, and family, environment and maturity on individual differences.

[3-0; 3-0]

312. (3) History of Psychology.—A survey of the principal trends of psychological explanation and events in the history of psychology from the earliest times to the present.

[3-0; 3-0]

315. (3) **Sensation and Perception.**—The sensory-perceptual processes whereby experience becomes meaningful and understanding develops; sensory mechanisms and fields; psychophysics; theories of perception; perception to the level of social interaction. [2-3; 2-3]

400. (3) **Abnormal Psychology.**—Abnormal behaviour and mental processes; field-trips and case-studies. Prerequisite: 3 units of third- or fourth-year courses in Psychology. For fourth-year and graduate students only. [3-0; 3-0]

401. (3) **Clinical Psychology.**—The clinical applications of psychology: the clinical process; the clinical psychologist's role and techniques in mental health-services. Prerequisite: three units of third- or fourth-year courses in Psychology. Primarily for fourth-year students. [3-0; 3-0]

403. (3) **Tests and Measurement.**—The principles underlying the construction of psychological tests; a critical evaluation of tests of intelligence, aptitude, achievement, attitude, interest and personality. Knowledge of elementary statistics is desirable. [3-0; 3-0]

404. (3) **Principles of Comparative Psychology.**—Fundamental principles of the behaviour of man and the lower animals examined from the comparative point of view. Prerequisite: Biology 101. [3-0; 3-0]

405. (3) **Social Learning.**—Classical and instrumental conditioning, cognitive learning, and learning by identification in the development of human behaviour. [3-0; 3-0]

406. (3) **Physiological Psychology.**—Physiological and neuroanatomical behaviour.

408. (3) **Social Psychological Theory.**—An intensive treatment of selected areas in social psychology. Emphasis on experimental evidence and theoretical integration. Areas include: attitude-change; social reinforcement; group-differences in personality; behaviour in large organizations. Prerequisite: three units of third- or fourth-year courses in Psychology. For fourth-year and graduate students only. Fourth-year and graduate students from cognate fields are admitted by permission. [3-0; 3-0]

409. (3) **Cognitive Processes.**—Problem-solving, concept-formation, thinking, reasoning and their relationships to other functional processes. Third- and fourth-year students will be enrolled in separate sections. [3-0; 3-0]

410. (3) **Methods in Research.**—Statistical techniques in psychological research, with special attention to the design of experiments. [2-3; 2-3]

412. (3) **Problems in General Psychology.**—For senior and graduate students who have had no course in psychology. This course may not be counted toward a major or Honours. [3-0; 3-0]

415. (3) **Occupational Psychology.**—The application of psychology to work, with emphasis upon the person in business, industry and public services. Credit is not granted for both 300 and the former 204. [3-0; 3-0]

449. (3) **Honours Essay.**

Graduate Courses:

500. (3) **History of Psychology.**

501. (3) **Social Psychology.**

503. (3) **Theory of Personality.**—Prerequisite: Psychology 305.

- 504. (3) Psysiological Psychology.
- 505. (3) Psychometrics.
- 506. (3) Perceptual Processes.
- 507. (3) Cognitive Processes.
- 508. (3) Human Factors and Systems-Research.
- 510. (3) Verbal Learning.
- 511. (3) Developmental Psychology.
- 512. (3) Advanced Methods in Research.
- 515. (3) Industrial Psychology.
- 516. (3) Advanced Experimental Psychology I.
- 517. (3) Advanced Experimental Psychology II.
- 518. (3) Topics in the Dynamics of Behaviour.
- 530. (3) Principles and Techniques of Evaluation of Personality.
- 540. (3) Principles and Techniques of Intellectual Assessment.
- 541. (3) Objective Tests in Diagnosis and Adjustment of Personality.
- 542. (3) Clinical Psychology: Seminar.
- 543. (3) Principles of Psychotherapy.
- 544. (3) Patterns of Child-Rearing.
- 545. (3) Advanced Statistics I.
- 546. (1-3) Seminar in Psychological Problems.
- 547. (1-3) Reading and Conference.
- 548. (1) Departmental Seminar.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

RELIGIOUS STUDIES

The Department offers programmes of study that lead to the degree of B.A.

Requirements for the degree of Bachelor of Arts:

Major

Second Year:

Religious Studies 200

Third and Fourth Years:

15 units

Honours

Admission:

First or Second Class in Religious Studies 200

Reading knowledge of Chinese, Greek, Hebrew or Latin. With permission of the Department, this requirement may be met in the Third and Fourth Years.

A reading knowledge of French or German is advised.

Third and Fourth Years:

A programme will be designed for each student consisting of 18-30 units, including a graduating essay

Note: Attention is called to the following courses in language (for a list of courses that meet the requirement in foreign language, see p. F20).

Asian Studies 101, 201 (Chinese)

Greek 100, 200, 325

Hebrew 100, 200

Latin 100, 110 or 120, 200, 210 or 220

(i) Courses in RELIGIOUS STUDIES

200. (3) **Introduction to Religious Studies.**—An introduction to the study of religion, including a survey of the origins, ideas and practices of the major religions. [3-0; 3-0]

205. (3) **The History of the Christian Church.**—A survey of the history of the Christian Church from the close of the period of the New Testament to the present day. [3-0; 3-0]

300. (3) **The Religions of India.**—The religious traditions, institutions and practices of India, from Vedic times to the present. [3-0; 3-0]

302. (3) **Buddhism.**—The nature and development of Buddhism with an introduction to its principal schools. [3-0; 3-0]

304. (3) **The History and Religions of the Ancient Near East.**—The history and religious thought of the peoples of the Ancient Near East from the third millennium to 330 B.C. [3-0; 3-0]

+305. (3) **The History and Religion of Israel.**—The history, literature and religion from its beginnings to 539 B.C. [3-0; 3-0]

306. (3) **The New Testament and Christian Origins.** [3-0; 3-0]

307. (3) **History of Christian Thought.**—The development of Christian doctrine from its biblical sources up to and including the Reformation. [3-0; 3-0]

400. (3) **Contemporary European Christian Thought.** [0-2; 0-2]

401. (3) **Contemporary American Christian Thought.** [0-2; 0-2]

+405. (3) **The Synoptic Gospels and the Historical Jesus.** [0-2; 0-2]

460. (3) **The Pauline Epistles.**—The literary, historical and theological aspects of the letters of Paul. [0-2; 0-2]

407. (3) **Archaeology and Mythology of the Ancient Near East.** [0-2; 0-2]

412. (3) **Chinese Mahayana Buddhism.**

421 (3-6) **Honours Tutorial.**

449. (3-6) **Honours Essay.**

(ii) Courses in HEBREW

100. (3) **Elementary Hebrew (Biblical).**—Elements of grammar and translation of prose. [3-0; 3-0]

200. (3) **Intermediate Hebrew.**—A second year of Biblical Hebrew with emphasis on rapid reading of prose and poetry and on exegesis. [3-0; 3-0]

ROMANCE STUDIES

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Majors

French

First Year:

French 120*

Second Year:

French 220*

Third and Fourth Years:

French 302

12 additional units in courses numbered above 300

Italian

First and Second Years:

Italian 100 and 200

Third and Fourth Years:

Italian 401

12 additional units in courses numbered above 300

Spanish

First and Second Years:

Spanish 100 and 200

Third and Fourth Years:

Spanish 300

12 units in courses numbered above 300

Honours

French

Admission:

French 120*

One year of Latin if Latin 12 (92) has not been passed in High School

Second Year:

French 220*

Third and Fourth Years:

French 302 and 409

18 units in French numbered above 300, including a graduating essay (3-6 units)

*See note on p. F78.

Italian

Admission:

Italian 100

One year of Latin (see under French)

Second Year:

Italian 200

Third and Fourth Years:

Italian 401

21 units in Italian numbered above 300, including a graduating essay (3-6 units)

Spanish

Admission:

Spanish 100

One year of Latin (see under French)

Second Year:

Spanish 200

Third and Fourth Years:

Spanish 300

21 units in Spanish numbered above 300, including a graduating essay (3-6 units)

Romance Studies

Admission:

Satisfactory standing in the courses taken within the Department

One year of Latin (see under French)

Third and Fourth Years:

24 units numbered 300 and above in at least two of the languages offered, including a graduating essay (3-6 units)

(i) Courses in FRENCH

110. (3) First-Year French.—Prerequisite: French 11 (91). [3-1; 3-1]
 120. (3) French Language and Literature, Part I.—Prerequisite: French 12 (92). [3-1; 3-1]
 210. (3) Second-Year French.—Prerequisite: French 110. [3-1; 3-1]
 220. (3) French Language and Literature, Part II.—Prerequisite: French 120 or First-Class standing in French 110. [3-1; 3-1]

*With the consent of the Department, courses numbered 110 and 210 may be offered instead of 120 and 220, but in such cases 223 must be completed before 302 can be taken. Students who do not achieve Second-Class standing in French 220 will be required to take 223 before taking 302. Courses 223, 302, 304 are all courses in language and style, of increasing difficulty, and may not be taken concurrently.

223. (3) Practice in Speech and Writing.—Composition, discussion, dictation, stylistics, advanced translation. [3-1; 3-1]
302. (3) Studies in French Language and Style.—Composition, syntax, translation and oral practice. [3-1; 3-1]
304. (3) Advanced Studies in French Language and Style. [3-0; 3-0]
306. (3) French Phonetics.—Theory and practice of French pronunciation: articulatory fundamentals; systems of transcription. [3-0; 3-0]
310. (3) Modern French.—A description of phonology, grammar and vocabulary. [3-0; 3-0]
407. (3) Mediaeval French Literature.—The development of the literary language from Vulgar Latin to Old French. [3-0; 3-0]
408. (3) Literature of the Sixteenth Century.—The French Renaissance; readings from Rabelais, Ronsard and Montaigne. [3-0; 3-0]
409. (3) Literature of the Seventeenth Century.—Representative poetry and prose with emphasis on Corneille, Racine, Molière, Descartes, Pascal and La Fontaine. [3-0; 3-0]
410. (3) Literature of the Eighteenth Century.—The drama, the novel and the basic writings of Montesquieu, Voltaire, Diderot and Rousseau. [3-0; 3-0]
411. (3) The Romantic Movement in France.—Representative works from the poetry, theatre and novel of the first half of the nineteenth century. [3-0; 3-0]
412. (3) Baudelaire, The Parnassian and Symbolist Movements.—The poetry, theatre and criticism of the second half of the nineteenth century. [3-0; 3-0]
413. (3) The Novel from the Goncourt Brothers to Proust.—Literary trends and parallel developments in the fields of paintings and music. [3-0; 3-0]
414. (3) The Theatre from 1900 to the Present.—Representative plays and main trends. [3-0; 3-0]
415. (3) The Contemporary Novel from 1918.—Representative novels and essays from Gide to Camus. [3-0; 3-0]
416. (3) French Canadian Literature.—Characteristic works from the Conquest to the present. [3-0; 3-0]
420. (3) French Language and Literature.—Selected topics. [3-0; 3-0]
449. (3-6) Honours Essay.

Graduate Courses:

500. (1) Bibliography.
501. (3) The Literature of Mediaeval France.
502. (3) Studies in Sixteenth-Century Literature.
503. (3) French Society in the Seventeenth Century.
504. (3) The Novel from 1600 to 1680.
505. (3) Studies in Seventeenth-Century Theatre.
506. (3) The Novel from 1680 to 1735.
507. (3) The French Enlightenment.

508. (3) Studies in French Romantic Literature.
 509. (3) Studies in Nineteenth-Century Theatre.
 510. (3) Modern Poetry from Baudelaire to the Present.
 511. (3) Contemporary French Literature.
 512. (3) Studies in Literary Criticism.
 513. (3) Problems in French-Canadian Literature.
 514. (3) Problems Relating to the French Novel.
 515. (3) Romance Philology.
 516. (3) History of the French Language.
 520. (3) French Language and Literature.
 549. (3-6) Master's Thesis.
 649. Ph.D. Thesis.

(ii) Courses in ITALIAN

100. (3) First-Year Italian.—Grammar, reading, conversation. [3-1; 3-1]
 200. (3) Second-Year Italian.—Reading, composition, conversation. Pre-requisite: Italian 100. [3-1; 3-1]
 223. (3) Italian Grammar, Composition and Translation. [3-1; 3-1]
 300. (3) Readings in Italian.—Prerequisite: completion of a course in a foreign language, other than Italian, numbered 200 or above. For students with no previous knowledge of Italian whose main interest is in literature. [3-0; 3-0]
 302. (3) Advanced Composition, Translation and Stylistics. [3-0; 3-0]
 305. (3) Contemporary Italian Literature.—Extensive reading, advanced composition. D'Annunzio, Ungaretti, Montale, Quasimodo, Pirandello, Svevo, Alvaro, Pavese, Moravia. [3-0; 3-0]
 310. (3) Italian Civilization.—The intellectual history of Italy. Lectures and reading in English. [3-0; 3-0]
 400. (3) History of the Italian Language.—The development of the vernacular from Vulgar Latin and its literary evolution to the present day. [3-0; 3-0]
 401. (3) Italian Literature of the Middle Ages.—Dante, Petrarch, Boccaccio and the minor lyric poets. [3-0; 3-0]
 402. (3) Italian Literature of the Renaissance.—Machiavelli, Castiglione, Ariosto, Tasso, Cellini and the lyric poets from Lorenzo de'Medici to Michelangelo. [3-0; 3-0]
 403. (3) Italian Literature from the Reformation to the Risorgimento.—Vico, Goldoni, Alfieri, Parini, Foscolo, Leopardi, Manzoni and minor poets from the Mannerists to the Romantics. [3-0; 3-0]
 404. (3) Italian Literature from the Risorgimento to the Present.—Carducci, Pascoli, Nievo, Verga, Fogazzaro and later developments in the novel, drama and lyric poetry. De Sanctis, Croce, Momigliano, Russo and the evolution of literary criticism. [3-0; 3-0]
 420. (3) Italian Language and Literature.—Selected topics. [3-0; 3-0]
 449. (3-6) Honours Essay.

Graduate Courses:

500. (3) Directed Readings in Italian.
 501. (3) Dante.
 549. (3-6) Master's Thesis.

(iii) Courses in SPANISH

100. (3) First-Year Spanish.—Grammar, composition, translation, oral practice. [3-1; 3-1]
 110. (3) First-Year Spanish.—Grammar, composition, translation, oral practice. Prerequisite: Spanish 11 or its equivalent. [3-1; 3-1]
 200. (3) Second-Year Spanish.—Grammar, composition, translation, oral practice, readings. Prerequisite: Spanish 100 or 110. [3-1; 3-1]
 223. (3) Reading, Translation and Conversation.—To be taken concurrently with Spanish 200 for those intending to continue their study of Spanish. Prerequisite: First or Second Class in Spanish 100. [3-0; 3-0]
 300. (3) Advanced Linguistic Study.—Composition, translation, syntax, phonetics, oral practice. [3-0; 3-0]
 301. (3) Survey of Spanish Literature.—Origins to the modern period. [3-0; 3-0]
 302. (3) The Generation of 1898.—With special reference to Unamuno, Baroja, Azorin, Valle-Inclán and their contemporaries. [3-0; 3-0]
 303. (3) Cervantes and His Age.—The writer and the background of his work and thought. [3-0; 3-0]
 400. (3) History of the Spanish Language.—The origins and development of Spanish; study of representative texts. [3-0; 3-0]
 401. (3) Mediaeval Spanish Literature.—Origins to the fifteenth century. [3-0; 3-0]
 402. (3) The Golden Age (I).—Lyric and Epic Poetry: the Spanish novel before Cervantes. [3-0; 3-0]
 403. (3) The Golden Age (II).—Prose writers of the sixteenth century; Baroque writers, the age of Quevedo. [3-0; 3-0]
 404. (3) The Spanish Theatre.—Representative works from the origins to the present. [3-0; 3-0]
 405. (3) Modern Spanish Poetry.—Rubén Darío to the present. [3-0; 3-0]
 406. (3) Modern Spanish Prose.—From the time of Larra; the evolution of the novel, contemporary essays and criticism. [3-0; 3-0]
 407. (3) Spanish-American Studies.—An outline of the history and the literature. [3-0; 3-0]
 408. (3) History of Spain.—Aspects of the growth of the Peninsular societies and the expansion of Spanish civilization in Europe and the New World. [3-0; 3-0]
 420. (3) Spanish Language and Literature.—Selected topics. [3-0; 3-0]
 449. (3-6) Honours Essay.

Graduate Courses:

- 501. (3) Problems in Spanish Linguistics.
- 502. (3) Mediaeval Studies.
- 503. (3) The Golden Age.
- 504. (3) The Eighteenth Century and Romanticism.
- 505. (3) Contemporary Spanish Literature.
- 506. (3) Latin-American Studies.
- 520. (3) Spanish Language and Literature.
- 549. (3-6) Master's Thesis.

(iv) Courses in ROMANCE STUDIES

- 300. (3) Portuguese.—Prerequisite: Completion of a course in Latin or a Romance language numbered 200 or above. [3-0; 3-0]
- 420. (3) Studies in Romance Languages and Literature. [3-0; 3-0]
- 519. (3) The Language and Literature of Old Provençal.—The principal literary works and the development of the language.
- 520. (3) Studies in Romance Languages and Literature.

SLAVONIC STUDIES

The Department offers programmes of study that lead to the degrees of M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Polish

First Year:

Polish 100

Second Year:

Polish 200

Third and Fourth Years:

Polish 320, 410

9 units in courses numbered 300 and above

Russian

First Year:

Russian 100

Second Year:

Russian 200

Third and Fourth Years:

15 units in courses numbered 300 and above

Slavonic Studies*Second Year:*

Slavonic Studies 205

Third and Fourth Years:

15 units in courses numbered 300 and above

Honours*First Year:*

Russian 100

Second Year:

Russian 200

Slavonic Studies 205 or Polish 110

Third and Fourth Years:

Russian 300

Russian 400

12 units chosen from courses numbered 300 and above in

Slavonic Studies

Russian

Comparative Philology

Polish (including 210)

A graduating essay (3 units)

Note: Russian 401, Comparative Philology 402 are essential for students wishing to do research in the fields of comparative Slavonic linguistics, philology, phonology and structural analysis.

The following courses are accepted for credit in Slavonic Studies:

History 332: Diplomacy of the World Powers to 1939

History 400: Intellectual History of Modern Europe

History 405: History of Imperial Russia, 1689-1917

History 408: History of the Hapsburg Monarch, 1273-1918

History 432: Diplomacy of the World Powers after 1939

The following courses are accepted for credit by other departments:

History:

Slavonic Studies 308, 330, 415, 448

International Relations:

Slavonic Studies 340, 412, 440, 448

Economics

Slavonic Studies 441

(i) COURSES IN POLISH

110. (3) **Basic Polish.**—An introductory course. [3-1; 3-1]
 201. (3) **Second-Year Polish.** [3-1; 3-1]
 320. (3) **Polish Literature.**—General introduction to Polish literature of the sixteenth to nineteenth centuries. [3-0; 3-0]

410. (3) **Modern Polish Literature.**—Twentieth-century Polish literature, with special attention to Wyspianski, Zeromski, Reymont, Irzykowski, Lesmian, Dabrowska, the experimental novel and the Skamander and Vanguard poets; selected contemporary topics and writers. [3-0; 3-0]

(ii) COURSES IN RUSSIAN

100. (3) **Basic Russian.**—An introductory course. Grammar, reading, translation, oral practice. [3-1; 3-1]

200. (3) **Second-Year Russian.**—Prerequisite: Russian 100.

(a) Regular second course in Russian. [3-1; 3-1]

(b) Russian for students of science.—Grammar and translation of Russian scientific material. Terminal course. [3-0; 3-0]

300. (3) **Third-Year Russian.**—Translation and composition. Prerequisite: Russian 200. [3-1; 3-1]

303. (3) **Russian.**—Russian morphology and syntax. Study of Russian phonemics and phonetics. Prerequisite: Russian 200. [3-0; 3-0]

318. (3) **Early Russian Literature.**—Kievan and Muscovite texts; the Povest; the Byliny; Daniil Zatochnik; the Domostroj, Ivan-Kurbskij correspondence. [3-0; 3-0]

391. (3) **Old Church Slavonic.**—Origin of Old Church Slavonic; its phonology and morphology; reading and critical interpretation of earliest texts. [3-0; 3-0]

400. (3) **Soviet Russian Literature.**—Literature and the Soviet Revolution. Emerging poets. Literature of NEP and Reconstruction. The organization-writer. "Zhdanovism" and "The Thaw." Given partly in Russian. [3-0; 3-0]

401. (3) **History of the Russian Language.**—The development of Russian from Common Slavic to the present. [3-0; 3-0]

403. (3) **Advanced Russian Grammar, Syntax and Composition.** [3-0; 3-0]

405. (3) **Tolstoy and Dostoevsky.**—Their thought and art against the background of their lives and times. Given in English. [3-0; 3-0]

Graduate Courses:

+508. (3) **History of Russian Drama.**

510. (3) **Chekhov and the Symbolists.**—Given in Russian.

516. (3) **Mayakovsky's Creative Heritage.**—Given in Russian.

+518. (3) **Two Centuries of the Russian Theatre (1756-1956).**

549. (3) **Master's Thesis.**

(iii) COURSES IN COMPARATIVE PHILOLOGY

402. (3) **Introduction to Comparative Slavonic Philology.**—Comparative study of morphology and phonology of Eastern, Western and South Slavic. [3-0; 3-0]

420. (3) **Indo-European Comparative Philology.** [3-0; 3-0]

449. (3) **Honours Essay.**

Graduate Course:

502. (3) **Comparative Slavonic Philology.**

(iv) COURSES IN SLAVONIC STUDIES

Note: A knowledge of Russian is not required for the courses listed below.

205. (3) **Economic History and Geography of U.S.S.R. and Eastern Europe.**—Study of land, people, natural resources, industry and agriculture, systems of transportation and routes of foreign trade of Russia (Soviet and Tzarist) and of other countries of Eastern Europe. [3-0; 3-0]

306. (3) **Russian Literature in Translation.**—Nineteenth- and early twentieth-century Russian writers. [3-0; 3-0]

308. (3) **History of Russia.**—The antecedents of the Russian State; foundation and growth, with particular attention to colonization and expansion; evolution of political institutions; the history of the revolutionary movement and the development of Russian Marxism; the Soviet State. [3-0; 3-0]

310. (3) **Cultural and Social History of the Slavs.**—The development of Slavonic cultures, including art, architecture, music, theatre and film, in the Soviet Union, Central Europe and the Balkans. [3-0; 3-0]

311. (3) **History of Eastern Europe (outside Russia).**—The Balkan states and the countries between Germany and Russia. [3-0; 3-0]

330. (3) **German-Slav Relations from the Earliest Times to the Present.** [3-0; 3-0]

340. (3) **The Peoples of the Soviet Union.**—Past and present geographical distribution; historical background; physical and cultural anthropology with special emphasis on the non-Slavic peoples; their influence on Russian culture; national minorities; integration of national minorities. [3-0; 3-0]

404. (3) **Geography of the Soviet Union.**—The distribution of population and its historical origins. The physical environment. The distribution of resources and economic activities. The major regions. Soviet power in the modern world. [3-0; 3-0]

412. (3) **The Theory of the Soviet State.**—The Russian background; Soviet form of society; its philosophy, development and interpretation in the light of the logic of economic planning and the official dogma. [3-0; 3-0]

415. (3) **History of Poland.**—The mediaeval period; Polish-Lithuanian Commonwealth; rise of the gentry "democracy"; Polish-Russian relations and the Ukrainian question; the Age of Reform and Partitions; Poland under foreign rule; rebirth of the Polish Republic; Poland in the Second World War; the Communist aftermath. [3-0; 3-0]

440. (3) **Communist Movements in Eastern Europe Since 1900.**—History of the Communist movements and parties in Eastern Europe, with emphasis on the smaller countries of the Soviet bloc. [3-0; 3-0]

441. (3) **Problems of Soviet Economic Growth.**—Soviet planning of production, distribution, formation of capital, investment and consumption. Prerequisite: Economics 313. [3-0; 3-0]

448. (3) **Nationalism and International Relations in Central and Eastern Europe. Seminar.**—The nineteenth and twentieth centuries. [3-0; 3-0]

449 (3) **Honours Essay.**

Graduate Courses:

504. (3) **Seminar in Russian History.**

505. (3) **Seminar in Soviet History.**

- 506. (3) The Slavs in the Hapsburg Monarchy, 1526-1918. Seminar.
- 512. (3) Problems in Eastern Europe in the nineteenth and twentieth centuries. Seminar.
- 514. (3) History of Russian Education.
- 541. (3) Selected Problems of Soviet Economic Development.
- 549. (3) Master's Thesis.

SOCIOLOGY

Sociology 200 is prerequisite to all other courses, unless otherwise indicated.

The Department offers programmes of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

Second Year:

Sociology 200

Third and Fourth Years:

Sociology 301 or 306

Sociology 315 or 325

Three of Sociology 405, 406, 410, 415, 420, 421, 430

Honours

Admission:

First or Second Class in Sociology 200

Third and Fourth Years:

21 units in Sociology including:

Sociology 405

Sociology 406

Sociology 441

Sociology 449

Courses offered:

200. (3) Introduction to Sociology.—A general introduction to the sociological analysis of selected topics: religion, work, politics, stratification, bureaucratic organizations, kinship, socialization, social roles. [3-0; 3-0]

301. (3) Deviance.—Forms of deviance; social roles of deviants; attitudes towards nonconformity; punishment and cure; evasion of rules; contributions of deviance to the functioning of social systems. [3-0; 3-0]

306. (3) Socialization.—Analysis of the acquisition and loss of membership in social groups, stages in the learning of social roles, and of the institutions concerned with the socialization of adults and children. [3-0; 3-0]

315. (3) Social Stratification.—Tendencies toward equality and inequality; manifestations of inequality (occupation, education, ethnic groups, income, power) and their consequences; theories of social class. [3-0; 3-0]

325. (3) **Introduction to the Theory of Organizations.**—Theory and description of the structure, process and change of bureaucratic organizations in various settings. [3-0; 3-0]

405. (3) **Sociological Theory.**—Classical contributions and current issues. [3-0; 3-0]

406. (3) **Methods of Research.**—Techniques in the collection of data and analysis; statistical problems.

410. (3) **Small Groups.**—Analysis and discussion of field-studies and laboratory-experiments; the contributions of this research to the development of theory.

412. (3) **Introduction to Sociological Problems.**—Major problems in sociological theory and research. (For students in the Fourth Year who have had no sociology.) [3-0; 3-0]

415. (3) **The Sociology of Religion.**—Description and analysis of various religious groups: organization and leadership, relationships to the state and other institutions, religious statistics, problems of definition of "religion"; theories of religion: functionalist, Marxist, psycho-analytic. [3-0; 3-0]

420. (3) **The Sociology of Work.**—Theoretical problems and empirical research in the meaning and social organization of work and the composition of occupational roles. [3-0; 3-0]

421. (3) **Political Sociology.**—Examination of sociological studies of voting, political movements, the internal government of voluntary organizations and the social context of political institutions. [3-0; 3-0]

425. (3) **Human Communities.**—Analysis of the structure of human communities in general. Discussion of the problems of work and leisure, ecology and mobility, size of community and politics. (Sociology 200 is not prerequisite to this course, which may not be included in a major in Sociology.) [3-0; 3-0]

430. (3) **Comparative Study of Social Institutions.** [3-0; 3-0]

441. (3) **Honours Seminar.**

449. (3) **Honours Essay.**

Graduate Courses:

A. Theory and Methods of Research

501. (1-3) Seminar.

502. (1-3) Seminar.

B. Relationships Between Individuals and Groups

511. (1-3) Seminar.

512. (1-3) Seminar.

C. Elements of Social Organization

521. (1-3) Seminar.

522. (1-3) Seminar.

D. Institutional Areas

531. (1-3) Seminar.

532. (1-3) Seminar.

- 533. (1-3) Directed Studies.
- 540. (1) Graduate Seminar.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

THEATRE

The Department offers programmes of study that lead to the degrees of M.A., B.A.

Requirements for the degree of Bachelor of Arts:

Major

First and Second Years:

Theatre 120 and 300

Third and Fourth Years:

15 units in Theatre, of which at least 6 must be chosen from

Theatre 310

Theatre 320

Theatre 410

Honours

Admission:

Theatre 120 (First or Second Class standing)

Theatre 300

Third and Fourth Years:

18 units including:

Theatre 310

Theatre 320

Theatre 410

Theatre 449

6 units chosen from

Theatre 400

Theatre 405

Theatre 420

Theatre 430

English 365

English 366

Creative Writing 407

Reading knowledge (by the end of the Fourth Year) of one of French, German, Italian, Spanish, Russian, Chinese, Japanese and Greek

Courses offered:

120. (3) **Introduction to Theatre.**—Theory and practice of the theatrical arts; the development of Western theatre; reading of representative plays.

[3-0; 3-0]

300. (3) **Theatre Practice.**—Speech and acting.

[2-2; 2-2]

301. (3) **Children's Theatre.**—The creative approach to drama with children and to theatre for children in the elementary school. For credit in the Faculty of Education. [3-0; 3-0]
310. (3) **History of the Theatre to 1700.** [3-0; 3-0]
320. (3) **History of Modern Theatre.**—The development of Western theatre since 1700, with emphasis upon the twentieth century. [3-0; 3-0]
330. (3) **History of the Film.** [3-0; 3-0]
350. (3) **Theatrical Production.** [2-3; 2-3]
400. (3) **Direction and Staging.**—Prerequisite: Theatre 300. [3-0; 3-2]
405. (3) **Design for the Theatre.**—The history, theory and practice of theatrical design. Prerequisite: Fine Arts 228. [2-3; 2-3]
410. (3) **Forms of Theatre.**—An examination in depth of a limited number of plays representative of the forms of theatre that have had the most significant and enduring influence upon the development of theatre from the Greek era to the present. Prerequisite: Theatre 310 or 320. [3-0; 3-0]
420. (3) **Styles in Acting.**—An advanced course in acting; detailed study of the major styles in the history of acting. Prerequisite: Theatre 300. Given in conjunction with Theatre 421. [2-3; 2-3]
421. (3) **Styles in Directing.**—An advanced course in directing; detailed study of the major styles in the history of production. Prerequisite: Theatre 400. Given in conjunction with Theatre 420. [2-3; 2-3]
430. (3) **Dramatic Theory.**—An advanced study of the principles of dramaturgy; extensive reading and discussion of the major writings on dramatic theory and criticism from Aristotle to the present. [3-0; 3-0]
449. (3) **Supervised Study and Honours Essay.**

Graduate Courses:

505. (3) **Scene Design.**
506. (3) **History and Design of Theatrical Costume.**
510. (3) **Seminar in Comparative Dramatic Literature.**—The Drama of the Grotesque 1896-1966.
515. (3) **Seminar: Studies in Theatrical Style.**
520. (3) **Direction and Production.**
525. (3) **Seminar: Study of a Major Dramatist.**
547. (3) **Directed Studies in Theatre and Drama.**
549. (3-6) **Master's Thesis.**

DEPARTMENT OF MUSIC

Faculty

G. WELTON MARQUIS, M.A. (Whitman), Ph.D. (U.S.C.), Professor and Head.

HARRY ADASKIN, Professor of Violin.

LLOYD H. SLIND, B.Sc. (Sask.), B.Mus. (Montreal; Sask.), D.Ed. (Florida), L.R.S.M., Associate Professor of Music Education.

- ALLEN CLINGMAN, M.Mus. (Drake), M.A., D.Ed. (Columbia), Associate Professor of Music Education.
- FRANK GAMBLE, B.F.A. (Neb.), M.A. (Catholic U. of A.), D.Ed. (Columbia), Associate Professor of Music Education.
- DONALD C. GIBBARD, M.A. (Washington), Associate Professor of Music Education.
- ROBERT B. MORRIS, B.Mus. (Capital), M.Mus. (Union Theological Seminary), D.V.Paed. (Indiana), Associate Professor of Voice and Director of the University Choir.
- HANS-KARL PILTZ, B.A. (Henderson State), M.Mus. (Northwestern), Associate Professor of Music History and Viola, Directory of the University Orchestra.
- ELLIOT WEISGARBER, M.Mus. (Eastman), Associate Professor of Composition and Theory, Director of Oriental Studies in Music.
- CORTLAND HULTBERG, B.Sc. (Northern Illinois), M.Mus. (Illinois), M.Mus. (Arizona), Assistant Professor of Composition and Theory, Director of University Chamber Singers, Director of the Electronic Music Workshop.
- JOHN LOBAN, M.M. (Catholic University), Assistant Professor of Violin and Music History.
- JOHN MURRAY, D.Ed. (Oregon), Assistant Professor of Music Education.
- DALE REUBART, B.A. (Kansas City), M.Mus., D.M.A. (U.S.C.), Assistant Professor of Piano and Theory.
- DOUGLAS TALNEY, B.Mus. (Lewis and Clark), M.Mus. (U.S.C.), Assistant Professor of Music History and Director of the University Choral Union.
- FRENCH TICKNER, B.M., M.Mus. (U.S.C.), Assistant Professor of Voice and Director of the Opera Workshop.
- CAMPBELL TROWSDALE, B.Mus., M.Ed., D.Ed. (Toronto), A.R.C.T., Assistant Professor of Music Education.
- EUGENE WILSON, B.Mus. (U.S.C.), M.A. (Washington), Assistant Professor of Cello and Music History.
- JEAN COULTHARD ADAMS, L.R.S.M., A.T.C.M., Special Lecturer.
- TERENCE BAILEY, B.Mus. (Toronto), M.F.A. (Princeton), Instructor of Music History.
- KATHRYN BAILEY, B.Mus (Pacific), M.Mus. (Indiana), Instructor of Piano and Music History.
- PAUL DOUGLAS, B.M.E. (Central Methodist), M.Mus. (Hartford), Instructor of Flute and Music History.
- JAMES SHELL, B.A., B.M.E. (North Texas), M.Mus. (Yale), Instructor of Horn and Theory.
- JOHN SWAN, B.Mus. (Toronto), M.Mus. (Yale), Instructor of Trumpet and Music Theory.
- FRANCES ADASKIN, Lecturer in Piano.
- BARBARA CUSTANCE, L.R.S.M., A.R.A.M., Lecturer in Piano.
- GLEN GEARY, B.A. (Brit. Col.), Lecturer in Piano.
- EDWINA HELLER, Warsaw State Conservatory, Lecturer in Piano.
- EDWARD PARKER, L.R.S.M., F.T.C.L., Lecturer in Piano.
- BORIS ROUBAKINE, Lausanne Music Institute, Lecturer in Piano.
- PHYLLIS SCHULTZ, A.R.C.M., L.R.S.M., Lecturer in Piano.
- MARSHALL SUMNER, B.Mus. (Chicago), Lecturer in Piano.

DONALD BROWN, L.R.C.T., Lecturer in Piano.

MARIE SCHILDER, Vienna, Lecturer in Piano.

BETH WATSON, A.R.C.T., Lecturer in Voice.

J. E. KESSLER, Budapest State Conservatory, C.B.C. Chamber Orchestra, Lecturer in Violin.

DOUGLAS STEWART, A.T.C.M., Lecturer in Violin.

ERNST FRIEDLANDER, Principal Cello, Vancouver Symphony, Lecturer in Cello.

JAMES HUNTER, Vancouver Symphony, Lecturer in Cello.

JOHN HAMILTON, Vancouver Symphony, Lecturer in String Bass.

CONRAD CROCKER, B.Mus. (Cincinnati), Vancouver Symphony, Lecturer in Flute.

CAROL KNIEBUSCH, B.Mus. (Illinois Wesleyan), M.Mus. (Indiana), Vancouver Symphony, Lecturer in Flute.

WARREN STANNARD, M.Mus. (Yale), Principal Oboe, Vancouver Symphony, Lecturer in Oboe.

HENRY OHLMAN, Vancouver Symphony, Lecturer in Clarinet.

ROBERT CREECH, B.A. (Brit. Col.), Principal Horn, Vancouver Symphony, Lecturer in Horn.

DOUGLAS KENT, Curtis Institute, Vancouver Symphony, Lecturer in Horn and Tuba.

KENNETH HOPKINS, Principal Trumpet, Vancouver Symphony, Lecturer in Trumpet.

JAMES COOMBES, Vancouver Symphony, Lecturer in Trombone.

DAVID ROBBINS, M.Sc. (U.S.C.), Principal Trombone, Vancouver Symphony, Lecturer in Trombone.

General Information

The Department of Music offers programmes of study that lead to the degrees of M.Mus., B.Ed., B.Mus., B.A. For a description of the programme leading to the degree of B.A. see pp. F64-F66.

For information concerning vocations open to those holding degrees in Music, see *Opportunities in Music*, Bulletin No. 1 of the Department of Music.

Requirements for the degree of Bachelor of Music:

Admission:

1. The entering class may be limited to sixty students on the basis of tests of musical aptitude and auditions administered by the Department of Music.
2. Students with musical diplomas but without university credit may be given advanced standing on the basis of entrance examinations in Music.
3. All entering students must take certain tests that will determine their placement.

Fees

Total annual fee, \$573.00; first term, \$301.00, due and payable on registration in September; second term, \$272.00, due and payable on the first day of the second term in January. Students in the Final Year will be assessed an additional fee of \$7.00 (Graduating Class Fee) in the first term.

Financial Assistance

Most scholarships in music are awarded to students who have completed at least one year of the course, but a few are given to entering students on the basis of auditions.

Performing Organizations

All students seeking the Bachelor of Music participate in the instrumental and choral ensembles sponsored by the Department of Music and directed by members of the regular Faculty. Any student may, however, enter these organizations after an audition, but without credit.

Recitals by Faculty and Students

Faculty Recitals: Members of the Faculty present formal recitals throughout the academic year, open to the public without charge. All students in the programme are expected to attend.

Collegium Musicum: The Department of Music presents regular lecture-concerts that feature unusual music from all historical periods. Each lecture is given twice, once at the noon-hour, and once in the evening. All students in the programme are required to attend one of the two performances.

Noon-Hour Recitals arranged by Professor Adaskin: On many Wednesdays, recitals feature outstanding soloists and chamber ensembles. Students in the programme may be required to attend.

Student Repertory Series: Informal recitals are held each week throughout the academic year on Wednesday afternoons at 3:30 in the Recital Hall of the Music Building. All students in the programme are required to attend and to participate as their instructors recommend.

Student Recital Series: More formal recitals are presented occasionally during the academic year. Normally two students will share one of these periods upon the recommendation of the faculty. Attendance is mandatory for students majoring in performance.

Graduation Recitals: All students of performance and composition must present full-length graduation recitals in partial fulfilment of their requirements. All students in the programme are expected to attend.

Programme for the Degree of Bachelor of Music

Major in Piano

All students planning to major in Piano are required to audition before the Faculty before fall registration. Students transferring from other universities will audition at the same time. Students currently registered in this course will be examined by the Faculty each spring before the end of the academic year.

The results of these auditions and examinations will determine (1) whether a student will be admitted to the Programme in Performance; (2) whether a student will be allowed to transfer credits in piano from other universities; (3) whether a student will be permitted to continue in the programme, or be allowed to advance. All students in performance are on probation during the first two years.

The first-year entrance-level in piano corresponds to the Toronto or Western Board Grade 10. However the student's acceptance is not guaranteed by the attainment of this level, or even higher levels, but is largely dependent upon the probability of subsequent rapid development.

It is possible but not recommended for the student to complete this course in three years after Grade 13 or its equivalent.

Auditions or Entrance: In general, the entering First Year student should be prepared as follows: major and minor scales and arpeggios at moderately rapid tempos; basic sight-reading skill; etudes, such as Czerny 299 or the equivalent; Two-Part Inventions of Bach; compositions of standard composers equivalent in difficulty to Beethoven's Sonata, Op. 10, No. 1. It must be remembered, however, that the ability to perform these or more difficult works does not mean that the student will be accepted if the Faculty believe that there will not be sufficient improvement during the following years.

Performance Levels in Piano

First Year: Scales and arpeggios in rapid tempos; sight-reading of solo pieces and accompaniments of moderate difficulty; more difficult Bach inventions, suites, preludes and fugues; sonatas by Scarlatti, Haydn, Mozart and Beethoven; shorter works by Schubert, Mendelssohn, Schumann and Chopin; less difficult twentieth-century works.

Second Year: Bach's Well-Tempered Clavier; suites and partitas; concertos by Mozart and Beethoven; added sonatas and works including those by Brahms, Liszt and significant twentieth-century composers.

Third Year: Partitas by Bach; toccatas, Chromatic Fantasy, Italian Concerto; sonatas by Beethoven, op. 53 to op. 111; the more demanding works of Romantic and Impressionistic composers; sonatas and shorter works of Schoenberg, Bartok, Hindemith, Stravinsky and other significant twentieth-century composers; added concertos from all periods.

Fourth Year: a programme of wider scope directed toward the fulfilment of minimum repertory requirements; considerable ensemble-playing and accompanying experience; satisfactory sight-reading ability in all periods, including the modern; at least two full recital programmes, one of which will be presented in the afternoon Student-Recital Series, the other to the Faculty before presentation in the Graduation Recital. One concerto, subject to competition, may be played with the University Symphony Orchestra.

<i>First Year</i>		<i>Second Year</i>	
(100) Theory of Music I	3	(200) Theory of Music II	3
(120) History of Music I	3	(320) History of Music II	3
(146) PIANO	3	(247) PIANO	4
¹ Large Ensemble	1	Large Ensemble	1
(100) English	3	(200) English	3
² Elective in Arts	3	Elective in Arts	3
	16		17

<i>Third Year</i>			<i>Fourth Year</i>		
(300)	Theory of Music III	3	(440)	Piano Techniques	2
(347)	PIANO	4	(448)	PIANO (Recital)	5
(149)	Accompanying I	1	(249)	Accompanying II	1
(161)	Piano Chamber Ensemble	1	(161)	Piano Chamber Ensemble	1
(422)	History of Keyboard Music	3		Electives in Arts	6
	Music Elective	3			15
	Electives in Arts	3			—
		18			

¹*Large Ensemble*: Students may elect any one of Music 150 (Orchestra), Music 152 (Wind Ensembles), Music 153 (University Singers) or Music 154 (University Choral Union), with the permission of the Department.

²*Electives in Arts*: Courses outside Music carrying credit in the Faculty of Arts, elected after consultation with the Department of Music.

Major in Voice

Before entering this area, students must audition before the Faculty during "New Student Week" before registration, singing music of their own choice. Students currently enrolled in performance will be examined each spring to determine whether advancement will be permitted.

First Year. Tone production and diction are stressed. Song-literature from the early Italian period and from oratorio is usually emphasized. During the first year the student will be carefully evaluated in regard to voice, musicianship and physical stamina for the purpose of determining whether he or she has the combination of talents needed for successful performance.

Second Year. Technical and interpretative studies are continued. The repertory will be expanded as the student's technical facility develops. As the use of foreign language is increased, French and German songs will comprise a large share of the literature to be studied.

Third Year. Considerable vocal agility, volume, range and pleasing tone quality should be achieved in the third year. Frequent group recitals will be encouraged. Operatic and oratorio arias are a necessary part of the repertoire as well as wide-ranging choices in all languages. Ability to perform contemporary English, Canadian and American songs will be expected.

Fourth Year. The fourth year should be devoted to the interpretative aspects of singing, supported by a growing technical command. It will be assumed that the student can satisfactorily perform any of the standard repertory for his or her vocal classification. A full-length recital (no longer than one hour and fifteen minutes including intermission) will be presented after approval by the Faculty.

<i>First Year</i>		<i>Second Year</i>	
(100) Theory of Music I	3	(200) Theory of Music II	3
(120) History of Music I	3	(320) History of Music II	3
(145) VOICE	2	(246) VOICE	3
(144) ¹ Piano	1	(244) Piano	1
² Large Ensemble	1	Large Ensemble	1
(100) English	3	(200) English	3
³ French	3	³ German	3
	16		17

(Song Concentration)

<i>Third Year</i>		<i>Fourth Year</i>	
(300) Theory of Music III	3	(447) VOICE (Recital)	4
(347) VOICE	4	Large Ensemble	1
(306) Conducting	2	⁴ Chamber Ensemble	1
(424) History of Vocal Music	3	Music Elective	3
Large Ensemble	1	⁵ Electives in Arts	6
⁴ Chamber Ensemble	1		15
³ Italian	3		17
	17		

(Opera Concentration)

<i>Third Year</i>		<i>Fourth Year</i>	
(300) Theory of Music III	3	(447) VOICE (Recital)	4
(339) Opera Workshop I	3	(439) Opera Workshop II	3
(347) VOICE	4	(423) History of Opera	3
Large Ensemble	1	Large Ensemble	1
³ Italian	3	Electives in Arts	6
⁵ Electives in Arts	3		17
	17		

¹Piano: A minimum of two years of study regardless of entering level.

²Large Ensemble: Students will enrol in either Music 153 (University Singers) or Music 154 (University Choral Union).

³Foreign Languages: In certain cases students may concentrate on one or two of the languages required, and the indicated sequence may be altered.

⁴Chamber Ensemble: Students will elect either Music 155 (Chamber Singers) or Music 156 (Collegium Musicum: Vocal Ensemble).

⁵Electives in Arts: Courses outside Music carrying credit in the Faculty of Arts, elected after consultation with the Department of Music.

Major in an Orchestral Instrument

The major in an Orchestral Instrument is formulated for the student who plans to become a professional performer or teacher in schools of music, conservatories or private studios.

Before entering this course, the student must audition before the Faculty during "New Student Week" before fall registration. In general, the entrance level corresponds to the Toronto or Western Board Grade X, although an entering level of approximately the ARCT or its equivalent is desirable. However, the possession of a diploma does not guarantee entrance, since there must also be the probability of great development during the required years at the University.

Students currently enrolled in this course will be examined each spring by the Faculty to determine whether there will be advancement, or whether the student may be required to withdraw.

Although solo performance is stressed in this course, all orchestral instrument-players will participate in small chamber ensembles. In the final year, a full-length graduation recital (a maximum of one hour and fifteen minutes including intermission) must be presented after approval by the Faculty.

MAJOR IN AN ORCHESTRAL INSTRUMENT

<i>First Year</i>			<i>Second Year</i>		
(100)	Theory of Music I	3	(200)	Theory of Music II	3
(120)	History of Music I	3	(320)	History of Music II	3
(146)	CONCENTRATION INSTRUMENT	3	(247)	CONCENTRATION INSTRUMENT	4
(144)	¹ Piano	1	(244)	Piano	1
	² Large Ensemble	1		Large Ensemble	1
	³ Chamber Ensemble	1		Chamber Ensemble	1
(100)	English	3	(200)	English	3
	⁴ Elective in Arts	3			
		18			16
 <i>Third Year</i>			 <i>Fourth Year</i>		
(300)	Theory of Music III	3	(448)	CONCENTRATION	
(347)	CONCENTRATION INSTRUMENT	4		INSTR. (Recital)	5
(306)	Conducting	2		Large Ensemble	1
(309)	Orchestration	2		Chamber Ensemble	1
	Large Ensemble	1		Music Elective	3
	Chamber Ensemble	1		Electives in Arts	6
	Elective in Arts	3			16
		16			

¹*Piano*: A minimum of two years must be studied regardless of entering level.

²*Large Ensemble*: String students will enrol in Music 150 (Orchestra). Wind students will enrol in Music 152 (Wind Ensembles).

³*Chamber Ensemble*: String students will enrol in Music 160 (String Chamber Ensembles). Wind students will enrol in Music 152 (Wind Ensembles).

⁴*Electives in Arts*: Courses outside Music carrying credit in the Faculty of Arts will be elected after consultation with the Department of Music.

Major in General Music

Students who wish to become directors of instrumental and choral programmes in the public schools may enter this programme. All students in this course also elect one non-musical area for a teaching major in addition to music.

This is a four-year course leading to the Bachelor of Music, to be followed by one year in the Faculty of Education at the University. (See the Calendar of the Faculty of Education for requirements.)

Graduates in General Music will be qualified to direct orchestras, bands and choruses in all grades, and to develop instrumental and choral programmes in elementary and secondary schools. The course is so planned as to train each student in all these areas. The degree will also allow the student to continue work toward graduate degrees without being penalized for lack of credits.

As this is not essentially a degree in "performance", no specific entrance-examinations will be given in vocal or instrumental areas. However, each student is required to study for three or four years with the Faculty in a concentration of his or her own choice (excluding piano): voice, strings, woodwinds or brasses.

Piano may be studied as a secondary instrument, and all students in General Music must pass examinations testing proficiency in piano before graduation. In general, the instruction in piano is directed toward sight-reading, and the student may start at any level.

It is possible to complete this degree in three years if a minimum of 15 units of first-year work has been completed in another programme and receives credit in the Faculty of Arts. It is not advisable, however, to attempt to complete the programme in three years, since the courses in Music must be compressed into a shortened period that may bring great pressure on the student. Furthermore, the student would have to enrol in the Summer Session in order to complete the recommended five-course major outside music.

MAJOR IN GENERAL MUSIC

<i>First Year</i>		<i>Second Year</i>	
(100) Theory of Music I	3	(200) Theory of Music II	3
(120) History of Music I	3	(320) History of Music II	3
(145) ¹ Concentration Field	2	(245) Concentration Field	2
(144) ² Secondary Field	1	(244) Secondary Field	1
³ Large Ensemble	1	(140) Class Strings	2
(100) English	3	Large Ensemble	1
⁴ Elective in Arts	3	(200) English	3
	—	⁴ Elective in Arts	3
	16		18

<i>Third Year</i>			<i>Fourth Year</i>		
(300)	Theory of Music III	3	(309)	Orchestration	2
(306)	Conducting	2	(445)	Concentration Field	2
(345)	Concentration Field	2	(444)	Secondary Field	1
(344)	Secondary Field	1	(141)	Class Brasses—Percussion	2
(142)	Class Woodwinds	2		Large Ensemble	1
	Large Ensemble	1		Chamber Ensemble	1
	⁵ Chamber Ensemble	1		Music Elective	3
	Music Elective	3		Electives in Arts	6
	Elective in Arts	3			<hr style="width: 100%; border: 0.5px solid black;"/>
		<hr style="width: 100%; border: 0.5px solid black;"/>			18
		18			

¹*Concentration*: Each student must earn eight units in either voice or an orchestral instrument. As this is not essentially a course in "performance", the student may start at any level.

²*Secondary Field*: Each student must pass examinations in piano before graduation. Completion of this requirement will permit the student to continue the study of piano, or to begin the study of a second instrument or voice.

³*Large Ensemble*: Students whose instrument is woodwind or brass will enrol each year in Music 152, University Wind Ensembles, for placement in large or small groups. Thus, in the first two years, Music 152 carries 1 unit of credit; during the last two years, it carries 2 units of credit. String students will enrol in Music 150, University Orchestra; students in voice will enrol in either Music 153 or Music 154.

⁴*Electives in Arts*: Courses outside Music chosen after consultation with the Department of Music.

⁵*Chamber Ensembles*: Each student, other than students of wind instruments, will enrol for a minimum of two years in one of the departmental chamber ensembles, depending upon the student's concentration.

Major in Music History

This four-year programme is formulated for the student planning to continue after graduation in the area of musicology and who wishes to obtain graduate degrees in Music with the ultimate aim of teaching in a university School of Music.

The student in this area must obtain a wide theoretical knowledge, a comprehensive background in musical history, a working knowledge of piano; he must possess an intense interest in art, literature, philosophy and other musical areas. A reading knowledge of both French and German is required before graduation.

As university teachers of Music normally instruct in more than one *musical* field, a student in this course should obtain great strength in at least one additional musical area, such as performance, theory — or both. These areas will be strengthened further in graduate study.

Very few students will know whether they are suited for this programme during the first year, but the course of study in all areas is so planned as to allow a change to another area after the completion of the first year without loss of time or credit.

Although this degree leads to university teaching, students interested in careers as music journalists or librarians of music will find its training invaluable.

MAJOR IN MUSIC HISTORY

<i>First Year</i>		<i>Second Year</i>	
(100) Theory of Music I	3	(200) Theory of Music II	3
(120) History of Music I	3	(320) History of Music II	3
(145) ¹ Applied Music	2	(245) Applied Music	2
² Large Ensemble	1	Large Ensemble	1
(100) English	3	(200) English	3
³ French or German	3	French or German	3
	15		15
<i>Third Year</i>		<i>Fourth Year</i>	
(300) Theory of Music III	3	(400) Theory of Music IV	3
(306) Conducting	2	(444) Applied Music	1
(345) Applied Music	2	Chamber Ensemble	1
⁴ Chamber Ensemble	1	Music History Electives	6
⁵ Music History Electives	6	⁷ Electives in Arts	6
⁶ Political History	3		
	17		17

¹ *Applied Music*: Students must study in some field of performance, although they must learn to use the piano at least as a teaching "tool." During the last year, the student may study a "historical" instrument, such as viol, recorder, or harpsichord.

² *Large Ensemble*: Students will enrol in Music 150 (Orchestra), 152 (Wind Ensembles), 153 (University Singers), or 154 (Choral Union), depending upon the student's major performance field.

³ *Foreign Languages*: If one of these languages was studied in high school, it is recommended that the other be elected in the University.

⁴ *Chamber Ensemble*: To be elected depending upon the student's performing field.

⁵ *Music History Electives*: Among these, Music 323, 324, and 425 must be elected.

⁶ *Political History*: While there is no limit to the amount of political and social history the musicologist should know, the student is advised to take one or more general history courses after consultation with the Department of Music.

⁷ *Electives in Arts*: Courses outside Music chosen after consultation with the Department of Music and carrying credit in the Faculty of Arts. A course in the history of fine arts is strongly recommended.

Major in Composition

This four-year programme is formulated for the student with particular capabilities in creative writing.

A student will not be allowed to enrol in this course unless he or she has already demonstrated ability in composition, although it is possible to enter it in the second year if the student has demonstrated creative ability in Music 100 (Theory of Music I), during the first year of another programme.

Composers will have every opportunity to hear their works performed by ensembles of students and Faculty during their four years at the University. Before graduation, a student majoring in Composition must present a full-length programme (no longer than one and one-half hours with intermission) of original compositions approved by the Department of Music.

Two copies of each approved work must be presented to the Department of Music, for retention in the Music Library. All presentation-copies must be inked or reproduced for permanency.

MAJOR IN COMPOSITION

<i>First Year</i>		<i>Second Year</i>	
(100) Theory of Music I	3	(200) Theory of Music II	3
(120) History of Music I	3	(320) History of Music II	3
(145) ¹ Applied Music	2	(245) Applied Music	2
² Large Ensemble	1	(107) Composition I	3
(100) English	3	Large Ensemble	1
³ Elective in Arts	3	(200) English	3
	15	Elective in Arts	3
			18
 <i>Third Year</i>		 <i>Fourth Year</i>	
(300) Theory of Music III	3	(400) Theory of Music IV	3
(207) Composition II	3	(307) Composition III (Recital)	3
(345) Applied Music	2	(445) Applied Music	2
(306) Conducting	2	(309) Orchestration	2
Large Ensemble	1	Large Ensemble	1
Music Elective	3	Music Elective	3
Elective in Arts	3	Elective in Arts	3
	17		17

¹*Applied Music*: A minimum of two years of piano must be studied, regardless of entering level. An orchestral instrument or voice may be studied after this requirement is fulfilled.

²*Large Ensemble*: String students will enrol in Music 150; wind students will enrol in Music 152; vocal students will enrol in either Music 153 or 154.

³*Electives in Arts*: Courses outside Music chosen after consultation with the Department of Music and carrying credit in the Faculty of Arts.

Note: For courses in Theory and Composition and the History of Music see pp. F64-F66.

Applied Music (for majors studying for the Bachelor and Master of Music).

140. (2) **Class Strings.**—Group instruction in all stringed instruments. [1-3; 1-3]
141. (2) **Class Brasses and Percussion.** [1-3; 1-3]
142. (2) **Class Woodwinds.** [1-3; 1-3]
143. (1) **Class Piano.**—Group instruction in piano. [0-1; 0-1]
144. 244. 344. 444. (1) **Private Applied.**—Private or group lessons in voice, piano and orchestral instruments. Two one-half hour lessons (or equivalent) each week with about one hour's practice each day. [0-1; 0-1]
145. 245. 345. 445. (2) **Private Applied.**—Private lessons in voice and orchestral instruments. Two one-half hour lessons (or equivalent) each week with about two hours' practice each day. [0-1; 0-1]
146. 246. 346. 446. (3) **Private Applied.**—Private lessons in voice, piano and orchestral instruments. Two one-half hour lessons (or equivalent) each week with about three hours' practice each day. [0-1; 0-1]
147. 247. 347. 447. (4) **Private Applied.**—Private lessons in voice, piano and orchestral instruments. Two one-half hour lessons (or equivalent) each week with about four hours' practice each day. [0-1; 0-1]
148. 248. 348. 448. (5) **Private Applied.**—Private lessons in voice, piano and orchestral instruments. Two one-half hour lessons (or equivalent) each week with about five hours' practice each day. [0-1; 0-1]
149. (1) **Accompanying I.**—Accompanying on the piano, harpsichord or organ under supervision by Faculty. [0-1; 0-1]
249. (1) **Accompanying II.**—Continuation of Music 149. [0-1; 0-1]
339. (3) **Opera Workshop I.**—Actual participation in performances by the Department. Open also to students outside Music without credit, after audition. [2-3; 2-3]
439. (3) **Opera Workshop II.**—A continuation of Music 339. [2-3; 2-3]
440. (2) **Piano Techniques.**—A study of music and techniques for piano. [2-0; 2-0]

Graduate Courses.

544. (1) **Private Applied.**—Private lessons in voice, piano and orchestral instruments; or in harpsichord, viola, recorder and other historical instruments. Two one-half hour lessons (or equivalent) each week with suitable practice.
545. (2) **Private Applied.**—Same as Music 544 with additional practice.
546. (3) **Private Applied.**—Same as Music 545 with additional practice.
549. (3) **Master's Thesis.**—Recital.

Ensembles. (Open to non-music students outside Music without credit, after audition).

150. (1) **University Symphony Orchestra.**

- | | |
|--|-----------------------|
| 151. (1) University Chamber Orchestra. | [0-4; 0-4] |
| 152. (1 or 2) University Wind Ensembles. | [0-4; 0-4] [0-8; 0-8] |
| 153. (1) University Singers. | [0-4; 0-4] |
| 154. (1) University Choral Union. | [0-4; 0-4] |
| 155. (1) University Chamber Singers. | [0-4; 0-4] |
| 156. (1) Collegium Musicum Ensemble. | [0-4; 0-4] |
| 160. (1) String Chamber Ensembles. | [0-4; 0-4] |
| 161. (1) Piano Chamber Ensembles. | [0-4; 0-4] |

(The following ensembles, without credit, are available only to graduate students.)

- 550. University Symphony Orchestra.
- 551. University Chamber Orchestra.
- 552. University Wind Ensembles.
- 553. University Singers.
- 554. University Choral Union.
- 555. University Chamber Singers.
- 556. Collegium Musicum Ensemble.
- 560. String Chamber Ensembles.
- 561. Piano Chamber Ensembles.

Music Education

(For credit in the Faculty of Education only.)

- 101. (3) **Elementary Theory.**—Fundamentals of musicianship.
- 201. (3) **Counterpoint and Harmony.**—A continuation and expansion of Music 101. Prerequisite: Music 101.
- 302. (3) **Instrumental Techniques.**—Instruction in the playing and teaching techniques of strings, brasses, woodwinds. Prerequisite: Music 201.
- 303. (3) **Choral Music.**—Principles and techniques of choral music. Prerequisite: Music 201.
- 401. (3) **Orchestration and Arranging.**—Techniques of writing and arranging for chorus, band and orchestra. Prerequisite: Music 201.

**SCHOOL
OF
HOME ECONOMICS**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The School of Home Economics calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance.

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication, "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

- MISS WINIFRED J. BRACHER, B.Sc. (H.Ec.) (McGill), A.M. (Columbia), Assistant Professor and Acting Head of the Department.
- MISS MARY E. HOLDER, B.Sc. (H.Ec.) (Mt. Allison), M.S. (Michigan State), Associate Professor.
- MISS MARGARET E. MACFARLANE, B.Sc. (H.Ec.) (Alta.), M.S. (Columbia), Associate Professor.
- MISS RUTH BLAIR, B.H.E. (Brit. Col.), M.S. (Cornell), Associate Professor and Director of Food Services.
- MISS MOIRA C. FEENEY, B.Sc. (H.Ec.) (St. Francis Xavier), M.S. (Pittsburg), Ph.D. (Penn. State), Assistant Professor.
- MISS ELEANORE R. LUND, B.Sc. (Wash.), M.S. (Cornell), Assistant Professor.
- MISS CLAIRE DAEM, B.H.E. (Brit. Col.), Instructor.
- MRS. RITA MCGREER, B.Sc. (H.Ec.) (Alta.), M.S. (Ill.), Instructor.
- MRS. GERALDINE ROESE, B.I.D. (Man.), Instructor.
- MISS MERNA J. BORROR, B.Sc. (Iowa State), M.Sc. (Oregon), Instructor.
- MRS. ANNE CARROW, M.A. (Toronto), Instructor.
- MRS. MADELEINE A. KIRK, B.H.E. (Brit. Col.), Lecturer.
- MISS EMMA HARRIS, B.A. (Puerto Rico), A.M. (Columbia), Honorary Associate Professor.
- MRS. D. M. L. EATON, B.Sc. (Alta.), Assistant Director of Food Services.
- MISS DORIS SCHUH, B.Sc. (H.Ec.) (Alta.). (On leave).
- MISS MARY MCLENNAN, B.H.E. (Brit. Col.), Dietitian-in-Charge, Acadia Camp.
- MRS. MARY STOVELL, B.H.E. (Brit. Col.), Dietitian-in-Charge, Ponderosa.
- MISS BETTY BRAIDWOOD, Dietitian-in-Charge, Common Block.
- MISS SHIRLEY VENABLES, B.H.E. (Brit. Col.), Dietitian-in-Charge, Fort Camp.
- MISS OLGA RUMEN, B.H.E. (Brit. Col.), Dietitian-in-Charge, Brock Memorial Hall.
- MISS SANDRA DUNMORE, B.H.E. (Brit. Col.), Dietitian-in-Charge, Thea Koerner Graduate Centre.
- MISS IRENE MAYRS, B.H.E. (Brit. Col.), Dietitian-in-Charge, Totem Park Residences.
- MISS SHIRLEY LOUIE, B.H.E. (Brit. Col.), Dietitian-in-Charge, Bus Stop.

SCHOOL OF HOME ECONOMICS

Admission

For regulations regarding admission, registration, and Grade 13 credits, see the General Information bulletin.

Students entering with Secondary School graduation (University Programme) standing in the fall of 1965 may proceed to the B.H.E. degree in four years or the Honours B.H.E. in five years. Students entering with five appropriate Grade 13 subjects would normally require one year less.

Degree Requirements

Prerequisites:

1. It is usual for a student to enter with a Home Economics major as part of her secondary school graduation programme.
2. A student who has not presented 15 units of Home Economics as a part of the secondary school graduation programme may be required to carry additional hours of work in certain courses to compensate for this lack.
3. A student who has completed Physics 91 will choose 3 units of preferred elective in place of Physics 103.
4. Students in Grade 13 should take Biology 101 or Zoology 105. Biology 100 may be substituted only if these courses are not offered.

Honours Degree—An Honours programme may be selected in Foods, Nutrition and Dietetics, or in Clothing, Textiles and Related Art. The following regulations govern Honours Courses:

- (1) A student proposing to take an Honours Course must obtain the consent of each department concerned. This consent will normally be given only if (a) the department or departments concerned are prepared to offer the Honours Course proposed; (b) the student has a clear academic record in the work of the first two years and has at least Second Class standing in the work of the Second Year and in the subject or subjects of specialization; and (c) the student has completed all prerequisite courses. She may not continue in an Honours Course after the Third Year without the consent of the departments concerned. Cards of application for admission to Honours Courses must be completed and approved during the first week of the first term in each year of the course.
- (2) A candidate for Honours will be required to complete 81 units of course work and to include a graduating essay which will count 3 to 6 units. A candidate for Honours in two subjects will not be required to present more than one graduating essay. The latest date for receiving graduating essays in the second term is the last day of lectures.
- (3) A candidate for Honours may be required at the end of the Final Year to take a general examination, oral, written, or both, as the department or departments concerned may decide.
- (4) Honours are of two grades, First and Second Class. A student who passes all her courses but fails to obtain a Second Class in her graduating essay or who fails to attain a Second Class average for her Third and Fourth Year courses may be granted an appropriate standing in a General Course.

Degree Programmes

It is advisable by the end of the First Year and essential by the end of the Second for the student to have decided upon a field of specialization in one of the following majors or in Honours in the B.H.E. programme:

Required Courses Leading to:

Bachelor of Home Economics Four-Year Programme		Honours Bachelor of Home Economics Five-Year Programme			
	Units	F.N.D.	Units	C.T.R.A.	Units
Chemistry 110 or 101 or 102 & 230	6	110 or 101, 205 & 230	9	110 or 101, 205 & 230	6-9
English 100	3	Biochemistry 410 and 200	3	and 200	6
Economics 200	3		3		3
Microbiology 200	3		3		3
Mathematics 110 or 120	3		3		3
*Physics 101 or 103 or 110	3	101 or 110	3	101 or 103 or 110	3
Psychology 100	3		3		3
Biology 101 & Zoology 303	6		6		6
Home Economics 101	1½		1½		1½
102, 104 & 106	3		3		3
105	3		3		3
201	1½		1½		—
300	3		3		3
303	3		3		3
410	1½		1½		1½
421	3		3		3
		302	1½		—
		413	1½		—
		431 (Seminar)	1½	Seminar	1½
		441 (Dir. Study)	3-6	Dir. Study	3
		Language	3	Language	3
TOTAL	49½		69-72		58½-61½
Additional units to total	60		81		81

Beyond these required courses a student will elect courses in a major which lead towards professional certification or is in keeping with a particular interest which may be pursued through graduate study. Selection to be made in close consultation with faculty advisor.

*Fields of Specialization***Majors—Four-Year Programme to B.H.E.**

Dietetics and Nutrition.—Commerce 359, H.E. 302, 304, 413, 414, 416, 431, Biochemistry 410, electives to required total units. Students are advised to have summer experience in food service under a dietitian. An internship of one year following graduation is required for certification as a dietitian.

General.—H.E. 302, 400, 401, 403, 420, 304 or 402, electives to required total units. Certification through fifth year in accordance with requirements of Faculty of Education for teaching.

* See Note 2 under *Prerequisites*.

Social Work—Minimum of 3 units of Home Economics selected from Third and Fourth year courses, English 200, 3 units Social Science, plus units to total required. The School of Social Work should be consulted with regard to professional preparation.

Suggested Electives for B.H.E. Programme—Agriculture 401, Agricultural Economics 403; Anthropology 200; Creative Writing 201 or 202; Ed. 416; English 200, 304; Fine Arts 125, 228, 325, 425; Psychology 206; Slavonic Studies 205, 311, 330; Sociology 200 or other Social Science; Commerce 151, 261, 363.

Honours—Five-Year Programme to B.H.E.—Electives to be chosen in consultation with faculty member.

Foods, Nutrition and Dietetics—H.E. 304, 414, 416, 420; Commerce 151; Microbiology 308; Dairy Science 413; Plant Science 321; Anthropology 200; Sociology 200; Psychology 206; French 110; German 100 or 110.

Students proceeding to Dietetic Internship must include Commerce 151, Home Economics 414 and 416.

Clothing, Textiles and Related Art—Home Economics 201, 203, 302, 400, 401, 402, 403, 420; Fine Arts 125, 228; Anthropology 200; Sociology 200; Psychology 206; French 110; German 100 or 110; Fine Arts 325, 326, 330, 425.

Major in Five-Year Programme for B.Ed. degree (secondary field): See calendar of Faculty of Education. Required courses: H.E. 101, 102, 104, 105, 106, 201, 300, 310, 403, 421. Entrance requirements as for B.H.E. programme. If Chemistry 91 has not been completed for Secondary School Graduation (University Programme), Chemistry 101 or 110 should be taken in First Year. A student who completes these courses may proceed towards the B.H.E. degree by complying with requirements above.

Courses for Credit Towards Other Degrees—The only course which may be taken for credit by students proceeding to the B.A. degree is H.E. 210. Students proceeding to degrees other than the B.A. may elect courses H.E. 210, 211, 310, 421, such election subject to the regulations for the degree toward which they are working.

Consideration may be given to the registration of a restricted number of students in professional courses H.E. 400, 403, 416. These students must submit evidence of specific vocational need and preparation through specialized courses in this or other schools or departments.

Unsatisfactory Standing

(a) A student who passes in fewer than six units (two courses) in the first year of University following Grade 12 will not be permitted to re-enrol at University to repeat the studies of that year. Consideration will be given to re-admitting a student in this category following his satisfactory completion of Grade 13 or its equivalent. A student who passes six units, while not receiving credit in the year, may re-enrol on probation to repeat his studies but during the subsequent session may be required to withdraw at any time for unsatisfactory progress.

(b) A student in the First Year who obtains credit for only nine units on a full programme will be re-admitted on probation but during the subsequent session may be required at any time to withdraw for unsatisfactory progress.

(c) A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to

withdraw from the University; he may be re-admitted after a period of at least one year if his appeal to Senate is supported by the Committee on Admissions of the Faculty concerned and upheld by Senate.

Fees (*subject to change without notice*)

First Term Fees, \$243 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$457 at time of registration. Fourth Year students are assessed an additional \$7 (\$250), the Graduating Class fee.

Second Term Fees, \$214, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Part-time Students—Consult the General Information bulletin, under Fees for partial courses. Additional expenses are incurred for fabrics, design supplies, special foods and residence in Home Management house.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be

granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the course of one academic year, and in one paper (3 units) in a partial course of 9 units or less.

Supplemental Examinations

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination no refund will be made. However if the candidate explains the circumstances of the failure to appear, a refund will be considered. The explanation must be submitted to the Registrar within 10 days of the scheduled date of the examination. A refund, if made, would be \$5.00 only.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

COURSES IN HOME ECONOMICS

The number of units assigned to a course is given in round brackets immediately following the course number.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms.	[2-3; 2-3]
1 lecture and 2 hours laboratory per week, first term.	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term.	[0-0; 1-2]
2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms.	[2-3-2; 2-3-2]

The following courses, with exceptions noted above, are open only to students of the degree course in Home Economics or, where required, Education.

101. (1½) *Colour and Design*.—A study of the fundamental design principles and the basic visual elements. Application of principles in experimental studio problems. [2-3]

102. (1½) *Textiles*.—A study of the historical and contemporary significance; physical, chemical, microscopic and biologic properties; fibre, yarn and fabric characteristics of the major natural and man-made fibres. Textbook: Labarthe, *Textiles: Origins to Usage*, 1964. [3-0; 0-0]

104. (1½) *Introductory Clothing*.—A study of physical, psychological, cultural, economic and aesthetic factors which influence clothing consumption. Prerequisite: H.E. 102. Textbook: Erwin, *Clothing for Moderns*, 1964, and Roach and Eicher, *Dress Adornment, and the Social Order*. [0-0; 2-1]

105. (3) *Food Management I*.—General and scientific aspects of food preservation, processing and preparation. Composition, structure, properties of food; effects of environmental conditions and added ingredients. Textbook: Hughes, Osee, *Introductory Foods*, 1962. [2-3; 2-3]

106. *Clothing Construction*.—Investigation and application of clothing construction principles on traditional and newly developed fabrics. Two-week workshop scheduled immediately following spring term examinations and completion of H.E. 102-104.

201. (1½) **Food Management II.**—Food supply—distribution and government regulations for protection of the consumer in Canada. Study of basic nutritional requirements; reference to world nutritional needs. Management of resources in meal preparation. Prerequisite: H.E. 105. [3-3]

203. (1½) **Textile Design.**—A study of materials, techniques and historical development of pattern; experimental studio problems. Prerequisites: H.E. 101, 102. Enrolment limited by laboratory facilities. [2-3; 0-0]

210. (3) **Foods.**—Economics of selection; scientific aspects of preparation; Chemistry 101 or 102 or 110, preceding or concurrently. [2-3; 2-3]

211. (3) **Textiles, Colour and Design in Retailing.**—Analysis of relationships of design elements; design standards for consumers. Experimental laboratory problems in visual elements, design processes, colour relationships and dynamics, display, layouts, forms in space, using various materials and techniques. A study of basic textile fibres, their source, characteristics and uses. The apparel industry. Textbooks: Scott, *Design Fundamentals*; Hess, *Textile Fibres and Their Uses*, 1954. [0-3; 3-0]

213. (3) **Problems in Consumer Buying.**—In relation to food, clothing, housing, equipment; family finance planning. [3-0; 3-0]

300. (3) **Home Management I.**—Management as an integrating force toward the realization of family goals and values; the decision-making function in management. Consideration of resources available within the family and its social setting. Prerequisite: Economics 200. Textbook: Gross and Crandall, *Management for Modern Families*, 2nd ed. 1963. [3-2; 3-2]

302. (1½) **Experimental Foods I.**—Introduction to research methods with practical problems selected in the area of foods. Prerequisites: H.E. 105, Chemistry 230. Textbook: Lowe, *Experimental Cookery*, 4th ed.; additional sources as recommended. [2-3; 0-0]

303. (3) **Principles of Nutrition.**—The impact of the nutritional environment upon an organism is studied at the cellular level and with reference to biochemical events which underlie all functions. Nutritional requirements throughout the life cycle are included and in this regard the focus is ecology that is Biochemical, Physical, and Social determination of malnutrition. Prerequisites: Chemistry 230; H.E. 201; Zoology 303 (may be taken concurrently). Textbook: Wohl and Goodhart, *Modern Nutrition in Health and Disease*, 3rd ed. [3-0; 3-0]

304. (1½) **Experimental Foods II.**—Individual research projects in the foods field. Prerequisite: H.E. 302. [0-0; 2-3]

306. (1½) **Experimental Design.**—Studio problems using various materials, techniques; design elements, designing processes, colour relationships, and dynamics, display, layouts, forms in space. Techniques of representation. Prerequisites: H.E. 101, 203. Textbook: Scott, *Design Fundamentals*, 1951. [0-3; 0-3]

310. (1½) **Introduction to Human Nutrition.**—Designed for Physical Education and Education majors; presenting background information required for effective teaching of Nutrition. It is desirable that students have Zoology 303, Vertebrate Physiology. Prerequisite: H.E. 201. [0-0; 2-0]

400. (1½) **Advanced Textiles I.**—Chemical and physical structure of man-made fibres. Fibre production, yarn development, fabric construction as applied to end uses in apparel, household and industrial fabrics. Fibre identification and physical testing of fabrics. Prerequisites: Chemistry 230, H.E. 102. [2-2; 0-0]

401. (3) **Advanced Clothing.**—Dress design by draping and flat pattern methods. Fundamentals of fashion. A brief survey of the history of costume. The garment industry. Textbook: Hillhouse and Mansfield, *Dress Design, Draping and Flat Pattern Making*, and Hollen, *Flat Pattern Methods*. Prerequisites: H.E. 101, 104, 106. [2-3; 2-3]

402. (1½) **Advanced Textiles II.**—Chemical and physical structure of natural-occurring fibres. Fibre production, yarn development, fabric construction as applied to end uses in apparel, household and industrial fabrics. The development and application of finishes. Special problems in chemical and physical testing of fabrics. Prerequisite: H.E. 400. [0-0; 2-2]

403. (1½) **Interior Design.**—Application of design principles in the selection and organization of interior furnishings. Traditional and contemporary concepts are studied. Prerequisites: H.E. 101. [0-0; 2-3]

410. (1½) **Communications.**—An understanding of communications and some techniques of communication. Emphasis is on various methods. Prerequisites: Fourth Year standing in Home Economics. [2-3]

413. (1½) **Diet and Disease.**—A study of the pathologic physiology of nutritional disease and the effects of nutrition therapy. Nutritional control of cellular metabolism is the focus. Prerequisites: Home Economics 303, Zoology 303, Biochemistry 410 (may be taken concurrently). [0-0; 2-3]

414. (1½) **Quantity Food Management.**—Problems involved in institution food production and service. Textbooks: West and Wood, *Food Service in Institutions*, 4th edition. Prerequisite: H.E. 302, 304. [2-3; 0-3]

416. (3) **Institution Administration.**—Economics of organization and management of institution food services. Textbook: West and Wood, *Food Service in Institutions*, 4th edition. Prerequisite: H.E. 302, 304; Commerce 359 or equivalent. [3-1; 3-1]

420. (1½) **Home Management II.**—Residence in Home Management House. Under special circumstances another course may be substituted with the approval of the Director of the School. Open only to Third and Fourth Year students.

421. (3) **Human Growth and Development; Family Relations.**—A multi-discipline course designed to provide the student with an understanding of normal growth and development of the individual throughout the life cycle; family relations and their significance in the development of family members; special problems in family living and community resources available to help meet them. Observations to be arranged. Open only to Third and Fourth year students. Prerequisites: Psychology 100. [3-0; 3-0]

431. (1½) **Nutrition Seminar.**—Reports and discussions of current topics in nutrition. Prerequisites: H.E. 303, Biochemistry 410 (may be taken concurrently). [0-0; 3-0]

SCHOOL OF LIBRARIANSHIP

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The School of Librarianship calendar, 1966-67

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ACADEMIC STAFF

- SAMUEL ROTHSTEIN, M.A. (Brit. Col.), B.L.S. (Calif.), Ph.D. (Ill.), Professor and Director of the School.
- GEORGE PITERNICK, A.B., B.L.S. (California), Associate Professor.
- MISS SHEILA A. EGOFF, B.A. (Toronto), Dip. in Librarianship (London), F.L.A., Assistant Professor.
- MISS MARION GILROY, M.A. (Toronto), B.L.S. (Columbia), Assistant Professor.
- RONALD A. HAGLER, B.A. (Ottawa), A.M.L.S., A.M., Ph.D. (Michigan), Assistant Professor.
- WILLIAM BLISS WOOD, A.B. (Brown), B.Sc. (Columbia), M.A. (Denver), Assistant Professor.
- WALTER LANNING, B.A. (Brit. Col.), B.L.S. (Columbia), Lecturer.
- MRS. ANNE BREARLEY, B.A. (Man.), A.L.A., Part-time Lecturer.
- ROBERT M. HAMILTON, B.A., B.L.S. (McGill), Part-time Lecturer.
- R. D. HILTON SMITH, F.L.A., Part-time Lecturer.
- MISS ANNA LEITH, B.A. (Brit. Col.), M.S. in L.S. (Wash.), Part-time Lecturer.
- COLIN WILLIAM FRASER, B.A., B.L.S. (McGill), Part-time Lecturer.

Visiting Lecturers, 1966-67

- MR. RONALD BAKER, Head, Department of English and Director of Academic Planning, Simon Fraser University.
- MR. ERIK BROMBERG, Librarian, Department of the Interior, Portland, Oregon.
- MRS. ELIZABETH COLYER, Director, Yukon Regional Library.
- MR. ROBERT L. DAVISON, Superintendent, B.C. Public Library Commission.
- MISS E. DEARING, Librarian, District of North Vancouver, British Columbia.
- DR. MALCOLM MCGREGOR, Professor and Head, Department of Classics.
- MR. GERALD J. OPPENHEIMER, Head, Health Sciences Library, University of Washington.
- MR. W. T. ORR, District Officer, National Film Board.
- MR. ROBERT PATCHELL, Canadian Broadcasting Corporation, Vancouver, British Columbia.
- MRS. SUSAN PORT, Librarian, Humanities Division, University of British Columbia Library.
- PROFESSOR STANLEY READ, Head, Department of English.
- MRS. JOAN SELBY, Head, Humanities Division, University Library.

- MR. GORDON R. SELMAN, Executive Assistant to the President.
DR. D. V. SMILEY, Associate Professor, Department of Political Science.
MR. R. D. HILTON SMITH, Adelphi Book Shop, Victoria, B.C.
MR. BASIL STUART-STUBBS, University Librarian.
MR. CURTIS W. STUCKI, Chief Catalog Librarian, University of Washington.
DR. NORMAN WILIMOVSKY, Professor and Director of the Institute of Fisheries.
MR. ALAN WOODLAND, Head, Reference Department, New Westminster Public Library.

Council of the School of Librarianship

- DENNIS M. HEALY, B.A., L. ès L., Docteur de l'Université de Paris, Professor and Dean of the Faculty of Arts.
R. L. DAVISON, B.A., B.L.S., Superintendent, B.C. Public Library Commission.
W. G. DIXON, B.A., Dip.S.W., A.M., Professor and Director, School of Social Work.
WALTER H. GAGE, M.A., LL.D., Professor and Dean of Inter-Faculty and Student Affairs.
PETER GROSSMAN, B.A., Lib. Cert., Director, Vancouver Public Library.
DEAN W. HALLIWELL, M.A., B.L.S., Head Librarian, University of Victoria.
W. E. IRELAND, B.A., M.A., Provincial Librarian and Archivist.
F. HENRY JOHNSON, M.A., D.Paed., Professor and Director of Elementary Teacher Education, Faculty of Education.
WALTER LANNING, B.A., B.L.S., Associate Professor, Faculty of Education.
M. F. MCGREGOR, M.A., Ph.D., F.R.S.C., Professor and Head, Department of Classics.
MISS MARGARET A. ORMSBY, M.A., Ph.D., LL.D., Professor and Head, Department of History.
J. LEWIS ROBINSON, B.A., M.A., Ph.D., Professor and Head, Department of Geography.
F. H. SOWARD, B.A., B.Litt., LL.D., F.R.S.C., Dean Emeritus and Acting Secretary to the Board of Governors.
BASIL STUART-STUBBS, B.A., B.L.S., University Librarian.
Members of the Faculty of the School.

THE SCHOOL OF LIBRARIANSHIP

History of the School

The School of Librarianship has had a long history and a brief existence. Recommendations for the establishment of a school at the University go as far back as 1921 and the proposal has been under active discussion since the 1940's.

In 1957 a study sponsored by the Public Library Commission of British Columbia* considered the growing need for professional librarians in Western Canada and urged "the establishment of a graduate library school at the University of British Columbia within the next three years".

In the spring of 1960, the University Senate approved the establishment of a graduate library school as part of the Faculty of Arts and Science. The School opened on September 6, 1961, and graduated its first class in May, 1962.

In February, 1963, the School of Librarianship was accredited by the Committee on Accreditation of the American Library Association. It is thus recognized by the American and Canadian Library Associations as fully meeting accepted standards for graduate education in librarianship and it is officially listed with the American library schools which grant the M.L.S. (5th year) degree.

The Nature of Librarianship

Libraries today are a fundamental part of the educational process; they are a basic resource for formal education at all levels, the chief means of self-education, and indispensable for scholarship and research. The task of librarians is to raise the value of print to its highest power. Librarians promote reading by making available a wide selection of materials; by organizing and describing the collections so as to facilitate their use; by stimulating and guiding reading for pleasure; by assisting and participating in the many-sided pursuit of information. Librarians must know and appreciate books and they must know how to make books effective.

Purpose of the School

The purpose of the School of Librarianship is to give a selected group of university graduates the understanding, motivation, skills and knowledge to make libraries most useful to our society and thus promote the ends which reading serves.

Teaching Programme

The School of Librarianship offers a one-year course for university graduates, leading to the degree of B.L.S. (Bachelor of Library Science—the hood is cadmium yellow).

The teaching programme of the School, while not ignoring the need for instruction in the technical aspects of librarianship, gives chief emphasis to developing in its students the understanding, motivation and bibliographical knowledge by which to make libraries most useful to our society. A close knowledge of books and the sources of information for their effective

*Training Professional Librarians for Western Canada; Report of the Special Committee on Library Education of the Public Library Commission, Victoria, Public Library Commission, 1957, p. 24.

use is the primary aim, and a semi-tutorial approach, by which faculty members work closely with students in small groups, is the basic teaching method.

Admission Requirements

Requirements for admission to the School of Librarianship are as follows:

1. The student must present an acceptable Bachelor's degree from a recognized university. There will normally be no limitation in respect of the Faculty or Department in which the degree has been earned unless in the opinion of the School the individual's preparation appears unsuitable for success in library work.

2. The applicant must show promise of satisfactory ability to do scholarly work, as evidenced principally by at least second class standing in the third and fourth years of undergraduate study.

3. The student must present credit (at the 200-level) in a language other than English or give evidence of a working knowledge of a foreign language judged by the School to be suitable for professional library work.

4. Students whose native language is not English must give satisfactory evidence of facility in English as determined by personal interview, academic credentials or special examination.

5. It is the policy of the School of Librarianship to accept only students whose personal and academic qualifications will fit them for successful practice in the library profession. Personal interviews will ordinarily be required of all students and in some cases students may be asked to take academic or aptitude tests prior to admission.

6. Applications for admission (forms available from the School or the Registrar) should be addressed to the Director of the School of Librarianship. Since enrollment in the School is limited, early application is advised, preferably by June 1 for the following September. Normally, applications received after July 31 cannot be considered for the following September.

7. In view of its limited enrollment, the School admits only full-time students at present.

Undergraduate Preparation

Undergraduate students who are considering librarianship as a career should consult the School about their courses. Interviews may be arranged at any time during the University year.

A broad cultural background is expected of all prospective librarians, and students should therefore, in the first and second years, select for electives courses which will give them some acquaintance with the humanities, sciences, and social sciences. In the work of the third and fourth years, the student should seek to gain special competence in at least one field of knowledge related insofar as can be foreseen to his special area of interest within librarianship. For example, students contemplating careers in public libraries would do well to take courses in government, public administration and the like.

A reading knowledge of foreign languages is useful in all areas of library work and essential in many. Students are advised to acquire a working knowledge of at least two foreign languages, preferably French, German, Russian, or Latin.

A large part of the work done in the School of Librarianship is normally submitted in typewritten form and students are therefore urged to develop some facility in typing before entering the School.

Student Advisors

Each student in the School of Librarianship is assigned to a member of faculty who is responsible for helping the student plan his programme and for advising him in other matters.

The School Year

The school year is divided into two terms. The first extends from September 7 until Christmas; the second from January 4 until May 5. Most courses are of one term's duration. Examinations take place in December and May, with field work (or special project) scheduled for a two-week period in the second term; the second term examinations begin on April 26 and end on May 5.

Requirements for the Degree of B.L.S. and Organization of the Course

The School of Librarianship offers a one-year graduate programme for students who already hold an acceptable Bachelor's degree. Candidates for the degree of Bachelor of Library Science (B.L.S.) must complete at least fifteen units of course work plus appropriate field work.

The programme for each student is to be arranged in consultation with his advisor. The normal programme for the B.L.S. degree calls for at least the minimum of units shown below to be taken within each area of study. Students may arrange to take additional courses within the School or in other departments of the University, and in exceptional cases may be permitted to substitute the latter for courses in librarianship. Field trips, field work as appropriate, and the seminars are also required but carry no credit.

The following is the usual plan of work:

First Term: Book selection and evaluation; Principles of cataloguing; Principles of classification and subject analysis (A); Reference work and bibliography (B); Fields and functions of library service (D); History of the book and the book trade or History of libraries or History of children's and young people's literature (E); Seminar (F).

Second Term: Advanced cataloguing and classification or Administration of technical services (A); Advanced reference work and government publications or Reading and readers' advisory services (B); Literature and bibliography of the sciences and technology or Literature and bibliography of the humanities and social sciences (C); College, university and research libraries or Municipal, regional and provincial libraries or School libraries or Special libraries or Library work with children and young people (D); Field work or Special project.

To complete his second-term programme, the student selects a fifth course from any of those listed in the preceding paragraph. In some instances, students may, with the approval of the faculty, substitute a programme of directed study for one of the elective courses of the second term.

Description of Courses

A. Formation, Organization and Bibliographic Description of Library Collections.—Criteria for evaluation and factors in the selection of the book stock; principles and basic methods of classification and subject analysis; cataloguing and descriptive bibliography; special problems in cataloguing and classification; operation of technical services. $4\frac{1}{2}$ -6 units*

* The unit value assigned to courses at The University of British Columbia is determined by the number of classroom hours per week. For example, a three-unit course is one which entails 3 hours of lectures per week for the year.

- B. Sources of Information and Readers' Advisory Services.**—Bibliographies and reference books and their use in gathering information; reader interest and needs; reading guidance; the library's role in adult education. 3-4½ units
- C. Literature and Bibliography of Special Fields.**—Detailed consideration of library resources and services in special fields (sciences and technology; humanities and social sciences); development, scope and present trends in scholarship; forms and agencies of publication; outstanding titles and authorities; sources of information for specialized reference work in these fields. 1½-3 units
- D. Role and Administration of Libraries.**—Objectives and functions of libraries; basic information about the principal fields of library service; detailed consideration of problems in the organization and operation of various types of libraries; college, university and research libraries; municipal, regional and provincial libraries; school libraries; special libraries; library work with children and young people. 3-6 units
- E. Background of Librarianship.**—History of libraries from earliest times to the present, with special attention to Canada; history of the manuscript and printed book, including the development and present status of publishing and the book trade; history of children's and young people's literature. 1½-3 units
- F. Seminar: Trends and Issues in Librarianship.**—A series of discussion meetings on current issues of major concern in librarianship, such as censorship, copyright, interlibrary cooperation, "bibliographical control", mechanization of library services, research in librarianship, etc. (no credit)
- G. Directed Study.**—With the approval of the faculty, selected students may substitute a programme of directed study for one of the elective courses of the second term. 1½ units

Examinations, Credit and Standing

1. Examinations in the School of Librarianship will be held at the end of each of the two terms. These examinations are obligatory for all students.

2. A student, in order to qualify for the B.L.S. degree, must obtain an average of not less than 65% on the work of the year. Courses will be graded as follows: 1st class: 80% or over; 2nd class: 65% to 80%; Pass: 60% to 65%; Fail: below 60%.

3. Any student whose average in the examinations of the first term is less than 60% may be required to withdraw. Similarly, where at any time the overall performance of the student indicates that he does not have the personal and academic qualifications for successful practice in the library profession, the School may, with the concurrence of Senate, require his withdrawal.

4. The School may grant supplemental examinations in the courses failed provided that (1) the student's attendance and performance in other respects have been satisfactory and (2) he has obtained an average of at least 65% in the work of the year, including the courses failed. The passing mark in supplemental examinations is 60%. A student who fails a supplemental examination may, at the discretion of the School, be allowed to remove this deficiency by repeating the course failed or by taking an acceptable alternative course. In either such case the pass mark will be 65%. With approval of the faculty, students may be permitted to take a programme of remedial studies in lieu of a formal supplemental examination. Such programmes are to be supervised by a member of the faculty and are to be conducted in the month immediately following the term in which the deficiency occurred.

5. Field trips and field work, as may be called for, are considered integral parts of the B.L.S. programme and satisfactory participation in each is required of all students.

6. Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.

7. Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

8. Re-readings are governed by the following regulations:

Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year.

Fees (*Subject to change without notice*)

First Term Fees, \$266 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$503 at time of registration.

Second Term Fees, \$237, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Expenses

Students are responsible for expenses incurred during field trips and field work. The estimated overall expense for the year, exclusive of room and board, would be:

Fees	\$503.00
Books	75.00
*Field trips	10.00
**Field work	_____
Incidentals	25.00
	\$613.00

* Applies only to field trips in the Vancouver area; more extensive trips could amount to \$50.00.

** If field work is done outside Vancouver provision should be made for additional costs depending upon distance and living expenses. The Librarianship Division of the Alumni Association, University of British Columbia, has established a loan fund to assist students in the matter of travel expenses for field work. Applications for such loans are to be made to the Director.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees. (See the General Information bulletin.)

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations, a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional

transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

General Information

Location.—The School of Librarianship is located on the top floor of the North Wing of the University Library.

Field Work.—The field work comprises a period of two to three weeks. It gives the student directed experience under actual operating library conditions. Libraries in British Columbia and elsewhere cooperate in offering students such opportunities. Students with considerable experience in library work may be permitted to choose a special project in lieu of field work.

Field Trips.—Field trips are arranged within the Session. For the most part these are one-day visits of observation in the libraries in the vicinity of the School and in Vancouver Island. Students are advised, however, that field trips of two or three days' duration may be required.

Courses Taken in Other Library Schools.—Some credit for courses taken in other library schools may be granted in cases where such courses are equated with those in the School of Librarianship. Applications for such transfer of credit should be addressed to the Director.

Placement.—The School of Librarianship does not guarantee positions to its graduates, but makes every effort to place them in positions suited to their aptitudes and interests. In general there is a steady demand for qualified graduates in Canada.

Age.—The School of Librarianship places no absolute stipulations with respect to age of applicants. However, preference in admissions is given to applicants under thirty-five years of age and to those who have been actively engaged within recent years in library work, teaching, academic studies or some similar intellectual pursuit.

Academic Load.—The B.L.S. programme calls for a minimum of eighteen hours per week of lectures and laboratories, plus field trips, colloquia and field work. Most students spend two or three hours on readings and assignments for each hour of class. The normal academic load is therefore estimated at about 60 hours per week.

Opportunity for Specialization.—The first term emphasizes the core curriculum and consists almost wholly of required courses. In the second term students are given opportunity to select courses in the fields of their special interest. Faculty advisors will assist students in the choice of appropriate courses for their preferred professional interest.

Certification of the Province of British Columbia.—Upon graduation, students of the School of Librarianship may, on application to the Board of Examiners, receive the Certificate of Professional Librarianship for the Province of British Columbia.

Library Resources.—Students in the School of Librarianship have at their disposal, for use and observation, a fine range of libraries and library systems in the Lower Mainland of B.C.

The University of British Columbia Library is the largest in Western Canada. Its total resources comprise over 750,000 volumes, with special strength in bibliographies, reference works and serials. The collection in the field of library science alone now numbers over 8,000 titles, and children's books are available in two other special collections.

The University of Victoria Library in Victoria and the Simon Fraser University Library in Burnaby present excellent examples of fast-developing academic libraries. The City of Vancouver has a large and growing urban system, while Victoria, New Westminster and Burnaby illustrate the services offered by good medium-sized public libraries in new and modern buildings. Two large regional systems, in the Fraser Valley and on Vancouver Island, are within two hours travel and provide examples of service to rural populations. The Provincial Library and the Provincial Archives are among the best of their kind in Canada. The British Columbia Public Library Commission provides an interesting combination of direct and consultative services to libraries, to groups and to individuals. Special libraries to be found in the area include those of the B.C. Hydro and Power Authority, the B.C. Telephone Company, the B.C. Medical Library Service, the Departments of Agriculture, Fisheries and Forest Pathology (housed on the University campus), the Crease Clinic of Psychological Medicine in Esson-dale, the Pacific Press and the B.C. Research Council. The Vancouver Schools' System provides an opportunity for a practical look at school libraries.

Housing.—Information and applications for residence in University-owned housing may be obtained by writing directly to the Office of the Housing Administrator, the University of British Columbia, Vancouver 8, B.C. University-owned housing includes a number of residence halls and some apartments for married students. Since such housing is limited, students are urged to apply early.

Off-campus housing is also available, but there is a heavy demand for accommodation near the campus. The Housing Administrator maintains a listing of off-campus facilities, including rooms with board, housekeeping rooms, apartments, and houses which are available to University students.

Part-Time Work.—University policy limits full-time students to ten hours work per week in campus jobs. Students should note that the academic load of the School of Librarianship is heavy; most students are advised to give full time to their studies, at least during the first term. All inquiries for part-time work at the University should be directed to the Office of Personnel Services.

Affiliated Organizations.—The Librarianship Division of the University of British Columbia Alumni Association brings together graduates who are interested in furthering the work of the School. The Division contributes funds for the assistance of students, sponsors programmes of continuing education, and serves as a medium of liaison between the School and the library profession.

The Pre-Librarianship Club, an undergraduate society at the University of British Columbia, enrolls students who are considering careers in professional librarianship. With the cooperation of members of the School faculty, the Club conducts a regular series of discussion meetings, lectures, film showings and library visits.

**THE SCHOOL
OF
SOCIAL WORK**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The School of Social Work calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

- WILLIAM G. DIXON, B.A., Dip. S.W. (Brit. Col.), A.M. (Chicago), Professor and Director of the School.
- MRS. HELEN McCRAE, B.A. (Toronto), M.S.W. (Brit. Col.), Professor.
- MISS MURIEL A. CUNLIFFE, B.A. (Brit. Col.), M.S.S. (Smith), Professor.
- MISS ANNE FURNESS, B.A. (McGill), M.S.W. (Brit. Col.) Associate Professor.
- MICHAEL WHEELER, B.A. (London), Diploma (London School of Economics), M.S.W. (Brit. Col.), Associate Professor.
- JOHN V. FORNATARO, B.A., B.S.W. (Toronto), M.S.W. (Brit. Col.), Associate Professor.
- MISS FRANCES A. McCUBBIN, B.A., M.S.W. (Brit. Col.), Associate Professor.
- JOHN A. CRANE, B.A. (Manitoba), M.S.W. (McGill), Ph.D. (Minnesota), Associate Professor.
- DONALD G. FINLAY, B.A., M.S.W. (Toronto), Ph.D. (Chicago), Associate Professor.
- WILLIAM M. NICHOLLS, B.A. (Toronto), M.Sc. (Springfield), Assistant Professor.
- MISS DAWN L. BRETT, Soc. Science Certificate (London School of Economics), B.S., M.S.W. (Ohio), Assistant Professor.
- GERALD W. PEPPER, B.A. (Alta.), M.S.W. (Brit. Col.), Assistant Professor and Director of Field Instruction.
- GLEN F. HAMILTON, B.A., M.S.W. (Brit. Col.), Ph.D. (Liverpool), Assistant Professor.
- MRS. MARY TADYCH, B.A. (Manchester), M.S.W. (Brit. Col.), Assistant Professor.
- MRS. CLARE N. McALLISTER, B.A., Diploma in Education, M.S.W. (Brit. Col.), Assistant Professor.
- J. McEWAN MACINTYRE, B.A., M.S.W. (Brit. Col.), Assistant Professor.
- DENNIS T. GUEST, B.A., M.S.W. (Brit. Col.), Assistant Professor.
- HAROLD G. GOODWIN, B.A. (Mount Allison), M.S.W. (Brit. Col.), Assistant Professor.
- P. ROSS McCLELLAND, B.A., B.Com. (Queen's), M.S.W. (Toronto), Assistant Professor.
- MRS. KAY BELANGER, B.A., M.S.W. (Brit. Col.), Assistant Professor.
- BEN CHUD, Instructor.
- MISS ELEANOR J. BRADLEY, Dip. S.W. (Brit. Col.), Cert. S.W. (Smith), R.N., Instructor and Social Work Supervisor, Child Health Programme.
- MISS ELLEN BATEMAN, B.A., M.S.W. (Brit. Col.), Instructor.
- HARVEY STALWICK, B.Sc. (Concordia), M.S.W. (Brit. Col.), Instructor.
- FRANK DINGMAN, B.A., M.S.W. (Toronto), Instructor.
- MRS. HELGA HICKS, B.A., M.S.W. (Brit. Col.), Instructor.
- JOHN A. MACDONALD, B.A., LL.B., B.S.W. (Brit. Col.), Instructor.
- ERNEST I. TAYLOR, B.A. (McGill), B.S.W. (Toronto), Instructor.

Part-time Lecturers

- MRS. ESTELLE CHAVE, B.A., M.S.W. (Brit. Col.); RICHARD L. RAMSAY, B.S. (Sir George Williams), M.A., Ed.D. (Columbia); ADRIAN MARRIAGE, M.A. (London); ERNEST D. HILL, B.A., M.S.W. (Brit. Col.); MISS EVE R. YOUNGE, B.A. (Alberta), M.A. (McGill).

Part-time Field Instructors

MRS. EDNA ALEXANDER.

MRS. LORNA GARRETT, B.A. (Sask.), M.S.W. (Brit. Col.).

MRS. MARY HILL, B.A. (Brit. Col.), M.Sc. (Columbia).

MRS. EDNA LAWRENCE, B.A., B.S.W. (Brit. Col.).

School Librarian

MRS. JOYCE CUMMINGS, A.B., M.L.S. (Berkeley).

1966-67

THE SCHOOL OF SOCIAL WORK

The School of Social Work, a part of the Faculty of Arts, offers work leading to the degree of M.S.W. The hood is lined with magenta. The School is accredited by the Council on Social Work Education, the authorized professional accrediting body for graduate social work education.

The accepted education for the profession of social work consists of a minimum of two university years of graduate study including lectures, clinical practice work in the field, and a research project or thesis, leading to the degree of Master of Social Work. The total course is designed to give a broad preparation for the field of social work and to develop skill in one or more fields of practice.

Admission

Requirements for entrance to the School of Social Work are as follows:

- (a) The Bachelor of Arts degree, or an equivalent, from a recognized university. Emphasis on the humanities; the social and the biological science is preferred.
- (b) Personal qualifications for the field of social work. Because maturity is an important factor, students are usually advised to wait until they are at least 21 years of age before beginning their professional education.
- (c) Application for entrance, on forms obtainable from the School, made preferably by May 15 for the following September. An interview with a member of the Faculty of the School (or, for out-of-town students, with a person designated by the School) is an essential part of the admissions procedure for both degree candidates and special students.

Undergraduate students who are considering social work as a career should consult the School each year about their courses. In addition to the arrangements for consultation during registration week, interviews may be arranged at any time during the University year on application to the School.

It is recommended that in the First and Second Years, undergraduates select for their electives as many introductory courses in the social and biological sciences as possible. Third and Fourth Year courses which are particularly likely to be suitable for undergraduates proceeding to social work are anthropology, economics, political science, psychology and sociology. Other suggested areas of study include biology, community planning, drama, geography, history, literature, music, philosophy and Slavonic studies.

Students in Physical Education, Home Economics, or Nursing who plan to enter Social Work are advised to consult the School as early as possible in their undergraduate course to ensure that they will meet the social work requirements.

The School may, with the approval of Senate, require the withdrawal of a student when, in the opinion of the Faculty, his performance indicates that he is an unsatisfactory candidate for professional education in Social Work.

Fees—Subject to change without notice

First Term Fees, \$266, 1st year; \$243, 2nd year (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees (1st year \$503; 2nd year \$457) at time of registration.

Second Term Fees, \$237, 1st year; \$214, 2nd year, are payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Partial course: (Consult the General Information bulletin for further details). Fees for a partial course are assessed at \$30 per unit; the A.M.S. fee is \$19 for 6 units or less, otherwise \$29.

Student Advisers

On entrance to the School each student is assigned to a member of Faculty who is responsible for assisting the student in planning his total programme of courses and in advising him at any time.

Organization of Course

The School of Social Work at the University of British Columbia early established a generic social work training and continues to emphasize this approach to professional education in line with the most recent developments in the social work field. This general training is planned to cover two years leading to the Master's degree and provides students with (1) a broad knowledge of the organization and administration of the social services (public and private); (2) an understanding of human behaviour as related to helping people with their problems; and (3) skill in the methods of social work, including casework, group work, community organization, and social research.

The School Year—Students are advised that the First Year is divided into two terms. The first extends from September to Christmas; the second from January to May. The Second Year is divided into three parts.

The Educational Programme

The School of Social Work offers a generic programme in the first year of study when all students take the same academic programme including courses in each of the three direct service methods—Casework, Groupwork and Community Organization. These courses emphasize not only the elements common to all social work practice, but also the principles of working with individuals, groups and communities respectively. During the first year field work placement, every effort is made to give the student some practice in each method.

In the second year the academic programme is the same for all students except that one of the three direct service methods is selected for concentrated study. The student will attend classes and receive field instruction in the chosen method, but opportunities may be given during the placement for some supervised experience in the other methods. Selection of the method of concentration should be made in consultation with faculty advisers.

Field Instruction

The purpose of field instruction is to enable students to test knowledge and to develop appropriate attitudes and skills in the practice of social work. The content of the field instruction sequence is designed to enable integration of theory and practice through supervised work in the provision of direct service to individuals and groups.

Field instruction is taken concurrently with the lecture programme throughout the academic year. The minimum time required in field instruction in both the first and second year is fifteen hours a week.

In this education experience, the student's field instructor is either a member

of the faculty or an agency staff member who has skill in teaching and is closely related to the School and its educational objectives.

A considerable number of agencies in the Lower Mainland Area are used as settings for field instruction. Students must assume the transportation costs involved in reaching the agency to which they are assigned.

There are some basic distinctions between the objectives of the first and second year of field instruction. The first year is designed to provide a broad range of learning experiences; therefore, field placements tend to be in multi-purpose settings—public and private family, child welfare and group service agencies. In the second year emphasis is placed upon developing competence in the method of concentration of the student's choice—social casework, social group work or community organization. In addition there is opportunity to focus work in a particular field of practice. Arrangements are made each year for a few suitable second-year students to have placements primarily in administration and research.

The following agencies and supervisors participated in the field instruction programme 1965-66:

Children's Aid Society of Vancouver

Mrs. A. Campbell	Miss M. Anderson
Mrs. C. Collier	Mrs. T. Kaufmann
Mrs. A. Fahrig	Mr. J. Sanders
Mrs. B. Ross	

Children's Aid Society of the Catholic Archdiocese of Vancouver

Mrs. M. Boyd	Miss K. Glass
Mrs. L. Garrett (Faculty)	

Cities and Municipalities (Social Welfare Department)

Vancouver	Burnaby	Langley
Mrs. C. Donnelly	Miss E. Bateman	Miss J. McDonald
Mrs. E. Lawrence	(Faculty)	
(Faculty)	Mr. R. McClelland	
Mrs. M. Puusepp	(Faculty)	
New Westminster	Richmond	West Vancouver
Mr. H. Stalwick	Mrs. E. Alexander	Mrs. M. Hill
(Faculty)	(Faculty)	(Faculty)

Lions Gate Hospital
Mr. E. Macintyre (Faculty)

Shaughnessy Hospital
Mrs. E. Laanemae
Mr. D. Weeks

Children's Hospital
Miss M. McCallum

G. F. Strong Rehabilitation Centre
Miss L. Vicelli

Canadian Arthritis and Rheumatoid Society

Miss M. McInnis

Aftercare Unit, Mental Health Centre

Mr. H. Goodwin (Faculty)

Provincial Mental Hospital

Mr. A. Beck
Mrs. F. Ireland
Miss J. McLean
Mr. R. Whitelaw

Child Health Programme

Mrs. H. Hicks

Vancouver Epilepsy Centre

Mr. L. Sampson

Mental Health Centre and Child Health Services

Miss O. Caldwell
Miss D. Coombe
Miss J. Bryenton

Mrs. I. Stolar
Mr. J. Quinn

Alexander Neighbourhood House

Miss M. Sweeny

Gordon Neighbourhood House

Mr. E. Helm
Mrs. J. Fitzpatrick

Cedar Cottage Neighbourhood House

Mr. G. Cue

Northshore Neighbourhood House

Mrs. B. Braithwaite

Area Development Project

Mr. E. Taylor (Faculty)

Family Service Agency

Mrs. J. Assimakos

Haney Correctional Institute

Mr. J. MacDonald (Faculty)

Catholic Family Service

Miss M. Wright

National Parole Board

Mr. B. K. Stevenson

Children's Foundation

Miss M. O'Connor

Community Chest and Council

Miss B. Ayres

Mr. D. Baker

Mr. W. Nicholls (Faculty)

Mr. R. Nann

Boys Club of Vancouver

Mr. D. McComb

Mr. R. Seebaran

Juvenile and Family Court

Mr. A. Cobbin

Mr. J. Cobbin

Young Women's Christian Association

Miss G. Gentleman

Provincial Probation Services —

New Westminster

Mr. F. Dingman (Faculty)

Willingdon School for Girls

Mrs. K. Belanger (Faculty)

Narcotics Addiction Foundation

Mr. J. Symons

Woodlands School

Miss D. Boond

Mrs. L. Juurup

Orientation Programme

The School of Social Work has instituted an Orientation Programme for all first year students. It starts at the beginning of the first term and continues for approximately two weeks.

There are a number of educational objectives associated with this Programme. A basic one is to make the beginning student's early stages of learning more useful and rewarding by providing at the outset a brief, basic knowledge of social work. Since many students place an over-emphasis on specialization, it is hoped that the Programme will aid them to recognize the importance of all phases of professional study and prompt an identification with the profession as a whole. A third objective is to foster an interest

in social change and a fourth the identification of the special place of social work in the broad field of social welfare.

The Orientation Programme consists of three parts: a short lecture series on the basic, background knowledge of social work; visits to social agencies and films deal with selected social problems and current approaches to dealing with them; discussion groups organized under Faculty leadership to give students full opportunity to gain information on social work and debate the approaches to the social problems they observe in the Orientation Programme.

Occasional Student

The student who, because of maturity, has been permitted to enrol in spite of deficiencies in his academic record is classified as an Occasional Student. The School of Social Work occasionally admits a non-degree student who shows clear promise of continuing leadership in the field of social work in practice, administration or research. The circumstances must be such as to make it unreasonable, in the opinion of the School, to expect the student to complete undergraduate education resulting in a degree. Usually such a candidate has had several years of experience in an agency of recognized standards. Tests with the Office of Student Services may be required as part of the evaluation process in determining the capacity of the candidate to do academic and professional work at a high level. An occasional student who shows consistent progress in his studies will be permitted to complete the two-year course.

DEGREE REQUIREMENTS

The Degree of Master of Social Work:

1. Candidates (except as noted below) should begin work leading toward the M.S.W. degree within five years after completing the first year or they may be required to complete further preparatory work.
2. Candidates who hold the B.A. degree and the Diploma for Social Work, and who have had satisfactory social work experience, may proceed with the course for the M.S.W. degree but may be required to complete certain other work including a qualifying examination.
3. Students accepted as candidates for the M.S.W. degree are required to complete satisfactorily a minimum of one year of University study including 9 units of lectures, 3 units of field instruction, and a thesis or research project to count for 3 units. Second Class standing is required of all candidates for the Master's degree.
4. The candidate is required to submit four copies of the completed thesis, of which at least the first two must be on good bond paper. If the thesis is approved, two copies are bound for permanent deposit in the University Library, one is retained by the School of Social Work and the fourth is made available to the agency or agencies most directly interested in the subject of the research project.
5. The latest date for submission of a thesis in time for graduation is April 30.
6. Students who fail to complete requirements for the M.S.W. degree (including thesis and oral examination) by the end of the session, are required to re-register as part-time students in a subsequent session, and to pay the

appropriate fees. The course requisite for the completion of the degree will be determined by the School on the basis of the circumstances and the academic record of the candidate.

7. The M.S.W. degree is granted on the basis of professional knowledge, skill of performance and research. An oral examination is required to provide the final evidence of the competence of the candidate. The oral examination may not be taken until all other requirements of the course have been met.

The following is the usual plan of courses for the First Year:

<i>First Term</i>	<i>Second Term</i>
S.W. 500, Orientation Programme	S.W. 501, Social Casework I
S.W. 501, Social Casework I	S.W. 502, Social Group Work I
S.W. 502, Social Group Work I	S.W. 503, Community Organization
S.W. 504, Human Growth and Social Environment, Part I	S.W. 504, Human Growth and Social Environment, Part II
S.W. 505, The Social Services, Part I	S.W. 505, The Social Services, Part II
S.W. 506, Social Research	S.W. 506, Social Research
S.W. 507, Social Work and the Law	S.W. 508, Field Instruction
S.W. 508, Field Instruction	

GENERAL REGULATIONS AND INFORMATION

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees. (See the General Information bulletin.)

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

Re-reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplemental Examinations

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances, a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination the refund will be \$5.00 only.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken.*" On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

COURSES IN SOCIAL WORK

The following courses, except Social Work 499, are open only to students who have made application and have been accepted for admission to the School of Social Work.

First Year courses (post-graduate) are numbered 500 and up, Second Year courses 600 and up. It is to be noted that the Second Year is divided into *three* terms. Courses numbered 625 and above will be offered in Summer Session and Extension classes and will not normally be given in the regular programme, with the exception of S.W. 625.

499. (3) **Introduction to Social Work.**—Not offered in 1966-67. Students are encouraged to register for a course in public administration. [3-0; 3-0]

500. **Orientation Programme.**—Introduction to the philosophy, concepts and practice of Social Work, utilizing lectures, field instruction, discussions, films and readings. Faculty.

501. (3) **Social Casework I and II.**—The course involves examination of social casework as a process for the restoration, maintenance or enhancement of individual and family social functioning. Relevant components are the determinants of problems in social functioning, the personality variables affecting outcome, the auspices and conditions under which help can be offered and

the principles inherent in the helping process. These components are identified and examined in increasing depth and breadth. Chave, Finlay, McCrae, Tadych.

502. (2) **Social Group Work I and II.**—The problem-solving approach in social group work practice. Following initial exploration of selected and interacting dimensions of small group functioning, emphasis is placed upon basic modes of intervention in enabling the individual and the group as a whole to realize selected goals. Chud, Furness and Hamilton.

503. (1) **Community Organization.**—Introduction to theory and practice of community organization in social work; concepts relevant to understanding the community and community problem-solving processes; the role of the professional worker in community organization; typical structures and programmes for community problem solving and health and welfare planning; key trends and issues, such as community organization and community development, community decision-making; impact of new social science concepts; relationship to other aspects of social work practice. Hill and Nicholls.

504. (3) **Human Behaviour and the Social Environment I and II.**—This course examines the factors that underlie an individual's social functioning. The emphasis is upon understanding adaptive social functioning and the factors which are basic to an assessment of potential for problem-solving and effective behaviour. The interaction between person and situation and significance of such concepts as ego identity, ego functioning and environmental stress are examined in the first term. In Term II personality growth and development in relation to the major integrative tasks at each period are traced. Emphasis is placed throughout the course on the implications for realizing social work objectives of maintaining, restoring or enhancing functioning. Finlay and McCubbin.

505. (3) **The Social Services, I and II.**—The present scope of public welfare and the social services: a comparative review of Canada, United States, and Great Britain. The development of social thought and social policy in regard to public provision for social welfare. Implications for social work. An examination of current issues in selected social problem areas. Guest, Chud, and Hamilton.

506. (2) **Social Research I and II.**—The functions of research in social work; problem formulation; research design; sources and methods of data collection; data analysis, sampling; measurement; selected statistical tools; other research techniques. Crane and Hamilton.

507. (1) **Social Work and the Law.**—Principles of the law with which the social worker must be familiar; structure of the court system; problems of judicial administration and law and their relationship to social work practice; legal responsibility of social workers in various social agencies. Fornataro and MacDonald.

508. (3) **Field Instruction I and II.**—Beginning social work practice under supervision in selected social agencies. Two days a week throughout the School year. Pepper and others.

601. (2) **Casework III and IV.**—The purpose of this course, in progression from S.W. 501, is to develop greater skill in social assessment, in casework planning as related to this assessment, and in treatment skills using the case-work process with both adults and children. The development of knowledge, skills and attitudes in the use of relationship as an essential tool in working with clients; its application in and setting where casework services are offered as all or part of the agency programme. Cunliffe and McCubbin.

602. (2) **Social Group Work III and IV.**—The problem-solving approach in social group work practice. In progression from S.W. 502 the focus is upon

differential factors in modes of intervention to enable the realization of individual and group goals; differential use of relationship, differential individual and group needs according to problem and field of practice. The final portion of the course is focussed upon work with administrative groups, work with volunteers and the organization of group services. Chud.

603. (2) Methods in Community Organization.—This is an advanced course in community organization methods in social work designed to extend and deepen the student's knowledge of, and skill in, performing tasks and implementing roles related to the community organization process. Emphasis is given to community problem-solving methodology and techniques; applications in specific settings such as community development, health and welfare planning; social power, social conflict, community decision-making and their influence on participation of citizens, special interest groups, governmental and voluntary agencies; relationship to administration and research processes; financing and its relationship to social planning. Nicholls.

604. (2) Human Growth and Social Environment III and IV.—This course is designed to broaden and deepen the basic knowledge gained in S.W. 504, continuing the holistic approach to the study of man's efforts to adapt to his social environment. Emphasis is upon deviant adaptation to this environment and the cultural and personality factors which produce this, together with the perceptions and responses of this environment to deviance in behaviour and personality structure. Cunliffe and Brett.

605. (1) Issues in Social Policy.—This course, designed as a progression from S.W. 503, examines the determinants of social policy, national and local, and the relationships between social policy and social work, lay and professional. Wheeler.

606. (3) Social Research III.—The formulation and planning of social welfare studies. Relation of research to concepts and professional literature; collection of data; methods and strategy of data analysis; report writing. Seminar, supplemented by individual or group consultations, for M.S.W. thesis or equivalent research project. Crane, Hamilton and others.

608. (3) Advanced Field Instruction.—Supervised practice work under supervision of more advanced character in appropriate social agencies. Two days a week, three terms. Pepper and others.

609. (2) Process and Management in Social Welfare Administration.—An introduction to the meaning and the functions of administration, especially in social welfare agencies. Content includes examination of: processes and social factors which are influential in organizational behaviour; significant concepts and principles of administrative theory; the main methods and procedures employed in administration. Fornataro.

612. (1) M.S.W. Tutorials.—Each student is assigned to a member of the School Faculty who serves as tutor for the academic year. The tutorials are devoted to a variety of topics which do not fall within the boundaries of any one course. Faculty.

613. (1) The Theory of Social Work.—A series of seminars, examining social work as an institution, designed to round off the professional understanding of social work for the M.S.W. graduate. The generic functions of social work; determinants, and formal characteristics; the nature of vocation and profession; the traditions of social work; the profession of social work as a value system, the radical ethic; the impact of bureaucracy; public images of social work. Marriage.

614. Master of Social Work Oral Examination.—Oral examination after all course work, field instruction and thesis are completed. (See notes above.)

625. (1) **Methods and Use of Supervision.**—An advanced course for students with appropriate experience and qualifications.

626. (1) **Social Work Methods, IV.**—Advanced study in casework, group work or community organization, for senior or special students.

627. (1) **Human Growth and Behavior, V.**—Advanced study of developmental theory applied to specialized material.

628. (1) **Problems of Social Welfare Administration.**—For appropriate students with experience or special needs in this area.

629. (1) **Contemporary Issues in Corrections.**—Advanced course on contemporary trends in correctional treatment and administration.

630. (1) **Social Research III.**—Administrative and experimental applications; for advanced students and agency personnel.

1966-67

**THE FACULTY
OF
COMMERCE
AND BUSINESS
ADMINISTRATION**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

**The Faculty of Commerce and Business Administration calendar,
1966-67**

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Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

- COLIN C. GOURLAY, B.Com. (Brit. Col.), M.Com. (Toronto), Professor and Acting Dean of the Faculty.
- RALPH R. LOFFMARK, M.L.A., B.A. (Toronto), M.B.A. (Pennsylvania), C.A., Graduate Osgoode Hall, Professor.
- PHILIP H. WHITE, M.Sc. (Est. Man.) (London), F.R.I.C.S., Professor and Chairman of the Division of Estate Management.
- LESLIE G. J. WONG, B.Com. (Brit. Col.), M.B.A. (Calif.), Professor and Chairman of the Division of Finance.
- DAVID C. AIRD, B.Com. (Brit. Col.), B.Sc. (N. Carolina State), M.B.A. (Queen's), Associate Professor.
- ARTHUR BEEDLE, B.Com. (London), C.A., Associate Professor and Chairman of the Division of Accounting.
- BRIAN E. BURKE, B.Com. (Brit. Col.), M.A., D.B.A. (Washington), C.G.A., Associate Professor.
- DONALD B. FIELDS, B.Com. (Brit. Col.), M.B.A. (Toronto), F.C.A., Associate Professor.
- NOEL A. HALL, B.Com. (Brit. Col.), M.B.A. (Calif.), D.B.A. (Harvard), Associate Professor and Chairman of the Division of Industrial Administration.
- ROBERT H. HEYWOOD, M.A. (Brit. Col.), Associate Professor and Chairman of the Division of Teacher Education (Commercial).
- WILLIAM HUGHES, B.Sc.(Econ.) (London), M.B.A., D.B.A. (Indiana), A. M. Inst. T., Associate Professor and Chairman of the Division of Transportation and Utilities.
- PETER A. LUSZTIG, B.Com. (Brit. Col.), M.B.A. (W. Ontario), Ph.D. (Calif.), Associate Professor.
- C. L. MITCHELL, B.Com. (Toronto), M.B.A. (Brit. Col.), C.A., Associate Professor.
- STANLEY M. OBERG, B.Com. (Brit. Col.), M.B.A., D.B.A. (Washington), Associate Professor.
- G. DAVID QUIRIN, M.A. (Alta.), Ph.D. (Princeton), Associate Professor.
- JAMES B. WARREN, B.A. (Wash.), M.B.A. (Calif.), Associate Professor and Chairman of the Division of Marketing.
- HUGH C. WILKINSON, B.Com. (Brit. Col.), M.B.A. (Wash.), Associate Professor.
- E. L. AFFLECK, B.A. (Brit. Col.), B.A. (Wash.), B.Ed. (Brit. Col.), C.A., Assistant Professor.
- EARL R. BLAINE, B.Com. (Brit. Col.), M.B.A. (Calif.), C.A., Assistant Professor.
- JAMES N. BRAY, B.S. (Illinois), M.B.A. (U.C.L.A.), Assistant Professor.
- GEORGE GORELIK, B.Com. (London), M.B.A. (Brit. Col.), C.G.A., Assistant Professor.
- TREVOR D. HEAVER, B.A. (Oxon.), M.A. (Indiana), Assistant Professor.
- LARRY F. MOORE, B.S. (Wyoming), M.B.A., D.B.A. (Colorado), Assistant Professor.
- VICTOR V. MURRAY, B.A. (Man.), M.A. (Minn.), Ph.D. (Cornell), Assistant Professor.

DANIEL L. McDONALD, B.Com. (Brit. Col.), M.B.A. (Calif.), Assistant Professor.

M. MURRAY MCKENZIE, B.A.Sc. (Brit. Col.), M.B.A. (Stanford), Assistant Professor.

JOHN C. NARVER, B.S., M.B.A., Ph.D. (California), Assistant Professor.

FREDERICK A. WEBSTER, B.S., M.B.A., Ph.D. (Calif.), Assistant Professor.

ROBERT J. GAYTON, B.Com. (Brit. Col.), C.A., Lecturer.

G. LAIRD, B.Com. (Brit. Col.), C.A., Lecturer.

STEPHEN H. ARCHER, B.A., M.A., Ph.D. (Minn.), Lecturer.

ENDEL J. KOLDE, B.S. (Estonia), D.H.S. (Stockholm), M.A., D.B.A. (Washington), Lecturer.

H. L. PURDY, B.A. (Brit. Col.), M.A. (Washington), M.A. (Hon.) (Dartmouth College), Ph.D. (Chicago), Lecturer.

GORDON J. CHAPMAN, B.S., B.A. (Missouri), D.S.C., D.B.A. (Indiana), Honorary Lecturer in Marketing.

RICHARD A. MAHONEY, B.A. (Man.), M.B.A. (Harvard), Honorary Lecturer.

E. CECIL ROPER, B.Sc. (Alta.), M.B.A. (Brit. Col.), Honorary Lecturer.

Division of Accounting: A. Beedle, Chairman; E. L. Affleck, E. R. Blaine, B. E. Burke, F. Field, D. B. Fields, R. J. Gayton, G. Gorelik, G. Laird, C. L. Mitchell, D. L. McDonald.

Division of Estate Management: P. H. White, Chairman; I. Davis, T. D. Heaver.

Division of Finance: L. G. J. Wong, Chairman; J. N. Bray, C. C. Gourlay, R. R. Loffmark, P. A. Lusztig, H. L. Purdy, G. D. Quirin, E. C. Roper, P. H. White.

Division of Industrial Administration: N. A. Hall, Chairman; D. C. Aird, L. F. Moore, V. V. Murray, M. M. McKenzie, H. C. Wilkinson.

Division of Marketing: J. B. Warren, Chairman; G. J. Chapman, J. C. Narver, S. M. Oberg, F. A. Webster.

Division of Policy and Administration: C. C. Gourlay, Chairman; R. R. Loffmark, R. A. Mahoney.

Division of Teacher Education (Commercial): R. H. Heywood, Chairman.

Division of Transportation & Utilities: W. Hughes, Chairman; T. D. Heaver.

Diploma Division: C. C. Gourlay, Chairman; E. L. Affleck, A. Beedle, G. Gorelik, R. H. Heywood, R. L. Stinson, J. B. Warren, P. H. White, L. G. J. Wong.

Members of Faculty from Other Departments

G. Creigh, B.A., Ph.D. (Birmingham); D. S. M. Huberman, B.A., LL.B. (Brit. Col.), LL.M. (Harvard); L. G. Jahnke, LL.B. (Sask.), LL.M. (London); Mrs. A. F. Livesey, M.A. (Brit. Col.); J. N. Lyon, LL.B. (Brit. Col.), LL.M. (Yale); K. M. Lysyk, B.A. (McGill), LL.B. (Sask.), B.C.L. (Oxon.); J. M. MacIntyre, B.Com., LL.B. (Brit. Col.), LL.M. (Harvard); P. A. Quartermain, B.A., Ph.D. (Nottingham); J. C. Smith, B.A., LL.B., LL.M.; R. N. Smith, M.A. (Brit. Col.), Ph.D. (Columbia); R. M. Will, B.A. (Western Ontario), A.M., Ph.D. (Duke).

Lecturers — Non-Faculty:

W. B. Affleck, B.Com. (Brit. Col.), C.G.A.; H. G. Aqua, B.Com., B.S.F. (Brit. Col.), C.G.A.; L. A. D. Battrum, C.G.A., A.C.I.S.; Miss C. M. Briscall, B.Com. (Brit. Col.), R.I.A.; D. Campbell, B.Com. (Brit. Col.), R.I.A.; D. Carter, B.Com., C.A.; V. H. Chadwick, C.A.; G. A. Chambers, C.A.; C. S. Burtinshaw, A.R.I.C.S.; A. L. Dartnell, B.Com. (Sir George Williams); C. H. Davies; L. N. Dyer, B.Com. (Brit. Col.), R.I.A.; M. Edwards, C.G.A.; J. B. Ferguson, C.A.; L. J. Fowler, B.Com. (Brit. Col.), C.A.; L. Getz, B.A., LL.B. (Cape Town), LL.M. (London), LL.M. (Harvard); J. M. Goldie, B.A., B.Ed. (Brit. Col.); B. M. Grant, B.Com. (Brit. Col.), C.A.; G. C. P. Gray, B.A. (Brit. Col.), C.A.; A. Guthrie, B.Com. (Man.), C.G.A.; J. G. Halpin, F.C.A.; D. M. Howard, B.Com. (Brit. Col.), C.A.; J. M. Hutton, B.Com. (Brit. Col.), C.A.; J. D. Kell, B.Com. (Manitoba), C.G.A.; I. M. Lochhead, B.Com. (Brit. Col.), C.A.; H. Loomer, B.Com., LL.B. (Brit. Col.); L. A. Milne, B.Com. (Brit. Col.), R.I.A.; R. J. Moir, LL.B.; G. Morfitt, B.Com. (Brit. Col.), C.A.; L. A. Parks, B.Com., C.A.; G. E. Parsons, F.R.I.C.S., F.C.I.Q.S.; F. E. Powell, B.Com. (Brit. Col.), C.A.; C. R. Riopel, B.Com. (Brit. Col.); D. W. Robertson, B.Com. (Brit. Col.), C.A.; H. L. Robinson; J. H. Shields, B.Com. (Brit. Col.), C.A.; D. R. Sinclair, C.A.; G. Sparling, B.A., M.A., B.Ed. (Brit. Col.); D. Staley, C.A.; R. J. D. Stuart, B.Com. (Brit. Col.), C.G.A.; B. Studer, C.A.; P. D. Thomas, B.A. (Brit. Col.), R.I.A.; A. R. Thompson, B.A. (McGill), C.G.A.; B. Treasurer, B.Com., C.A.; R. E. Tulk, B.Com. (Brit. Col.), C.A.; D. G. Usher, B.Com. (Brit. Col.), C.A.; C. Vickers, C.A.; F. E. Walden, B.Com. (Brit. Col.), F.C.A.; W. A. C. Wallace, C.A.; R. G. Wigindon, B.Com. (Brit. Col.), C.A.; N. W. Williams, B.A., LL.B.; G. W. Young, LL.B.; P. Woolley, M.A., C.A.; F. Field, F.C.A.

THE FACULTY OF COMMERCE AND BUSINESS ADMINISTRATION

The Faculty of Commerce and Business Administration offers courses leading to the degree of:

1. Bachelor of Commerce (B.Com.), after First Year Arts or Science.
2. Bachelor of Commerce (B.Com.), combined programme with C.A.
3. Bachelor of Commerce, Bachelor of Laws (B.Com., LL.B.), combined degree with Faculty of Law, option 12. (See the Faculty of Law calendar.)
4. Master of Business Administration (M.B.A.), for graduates of an approved university and with academic standing which meets the admission requirements of the Faculty of Graduate Studies.

The B.Com. hood is light grey with black and grey cord; the M.B.A. hood is the same but lined with the distinctive colour.

Courses Leading to the Degree of B.Com.

After First Year Arts or Science or Grade 13

This five-year programme, consisting of First Year Arts or Science and four years in the Faculty of Commerce and Business Administration, is intended for students interested in one of the specialized fields of administrative practice.

The first three years are devoted to laying a foundation in the related sciences and the humanities, and to introducing the student to basic business problems, principles, and practices.

The professional aspects of the curriculum are largely concentrated in the last two years. Because of the breadth and variety of techniques and practices involved, it has been found necessary to specify a "core" of courses which all students must take, and then to arrange a series of carefully selected and integrated programmes, known as "options", in one of which a student must register.

For each option, the necessary prerequisites are specified in the pre-Commerce Year, First Year and Second Year Commerce programmes. Few electives are provided within the option and no deviation from the prescribed course of studies in the field of concentration is allowed unless approved by the Dean.

Admission to B.Com. Courses

(1) The general requirements for admission to the University are given in the General Information bulletin.

(2) For admission to the Faculty of Commerce and Business Administration, students normally must have completed 15 units in First Year Arts or Science or the equivalent. Any exceptions to this rule must be approved by the Dean. Incomplete standing as a result of unsatisfactory performance in a normal programme in First Year Arts or its equivalent will not be considered an exceptional case.

(3) Admission with advanced standing: students will be admitted with such advanced standing as is approved by the Dean, subject to the general rule that all candidates for the degree of Bachelor of Commerce must be in residence and registered in Commerce for a minimum of two winter sessions.

(4) Students in First Year Arts or Science who are considering enrollment in the Faculty are advised to consult the Dean during their first year at the University.

Transfers from Applied Science to Commerce

(1) Students who have spent one or two years in Engineering may be admitted to advanced standing with some credit if there is evidence from their records that they will profit by training in the Faculty. They will require at least three years to complete any option in the Faculty.

(2) Students who have obtained full First Year standing in the B.A.Sc. Course will be admitted to First Year Commerce with credit in Mathematics (3 units), Science (3 units), and Engineering (3 units).

(3) Students who have obtained full or partial Second Year in the B.A.Sc. Course may be given credit towards a B.Com. degree for English (maximum of 3 units), Mathematics (maximum of 6 units), Science (maximum of 5 units), and Engineering (maximum of 4 units). They will be excused from Mathematics 205 but will be required to take Commerce 151, Commerce 190, and Economics 200.

(4) Students who wish to transfer should make application in writing to the Dean before the registration period, giving details of standing obtained in courses.

Optional Programmes

Students who complete the course of studies in any one of the following options will receive the degree of Bachelor of Commerce (B.Com.):

1. Accounting
2. Marketing
3. Industrial Administration
4. Finance
5. Transportation and Utilities
6. Commerce and Economics
7. Commerce and Public Administration
8. Commerce and Science
9. Commerce and Actuarial Science
10. Commerce and Teaching
11. Commerce and Forestry (No new students will be admitted to this option beginning 1965-66)
12. Commerce and Law (for combined degrees)
13. Industrial Relations
14. Estate Management

COMBINED PROGRAMME FOR C.A. AND DEGREE OF B.COM. (Option 1)

1. Students Eligible for Programme

- (a) No new enrolments will be accepted in this programme during the 1966-67 session.
- (b) Students will be eligible to register for the Combined Programme only if:
 - (i) they have completed all the requirements for admission, without condition, to the accounting option in First Year Commerce; (ii)

they are registered with the Institute of Chartered Accountants of British Columbia and are proceeding with the "Uniform Course" conducted by the Institute; (iii) they are recommended by the Institute and are approved by the Faculty of Commerce and Business Administration; (iv) they undertake, while registered at the University, to devote full time to the University part of the programme.

- (c) Students who at any time discontinue the "Uniform Course" will be ineligible to proceed with the Combined Programme.

2. Course Requirements for the B.Com. Degree in the Programme

- (a) Except where exemptions in certain specified subjects are granted as in (b) below, students taking the Combined Programme must complete all the course requirements announced in the Calendar for regular students in the accounting option.

- (b) At the discretion of the Faculty, students taking the Combined Programme may be granted exemption, up to 18 units, in the following courses:

Commerce 151 (3 units)—Fundamentals of Accounting; Commerce 253 (3 units)—Intermediate Accounting; Commerce 353 (1½ units)—Advanced Accounting; Commerce 450 (1½ units)—Accounting Problems; Commerce 455 (3 units)—Auditing; Commerce 331 (3 units)—Commercial Law; Commerce 432 (1½ units)—Statute Law; Commerce 356 (1½ units)—Accounting Systems. Exemption will be withdrawn, however, in the case of students who do not satisfactorily complete the "Uniform Course" of the Institute or who do not satisfy all other requirements of the University.

3. Attendance Requirements for Students in the Programme

- (a) Students will not be eligible to receive the B.Com. degree unless they have attended the University as full-time students for at least one regular winter session.

- (b) Students must take all course work by attendance as full-time students in regular winter sessions or in spring and summer sessions at the University.

4. Members of the provincial institutes of chartered accountants in Canada who wish to proceed to the degree of B.Com., accounting option, and who have completed, without condition, all the requirements for admission to the Faculty, may be granted the same course exemptions as defined in 2 (b) above. They must be in full-time attendance for a minimum of two winter sessions. Chartered accountants contemplating this programme should file with the Dean a full statement of qualifications before registering with the University.

THE DEGREE OF B.COM. COMBINED WITH THE DEGREE OF LL.B.

Completion of the pre-Commerce year, of the first three years in the Commerce and Law option in the Faculty of Commerce and Business Administration, and of three complete years in the Faculty of Law, at this University, are required for the combined degrees B.Com., LL.B. Students must meet the admission requirements of the Faculty of Law. Courses in Commerce may not be taken concurrently with courses in Law. The B.Com. degree will be awarded on completion of the Second Year in the Faculty of Law at this University.

FEES

(Subject to change without notice)

First Term Fees are payable in full at the time of registration. However, students may pay full fees at that time.

Second Term Fees are payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

	First Term	Second Term	Total
First Year (B.Com.)	\$243*	\$214	\$457
Second, Third and Fourth Years	\$282*	\$253	\$535
(B.Com.-C.A.) Spring Term	\$119*		\$119

Fourth Year students are assessed an additional \$7 to cover the graduating fee.

REGULATIONS REGARDING COMMERCE COURSES

(1) 15 units constitute a full course in First Year Commerce and 18 units constitute a full course in each of the remaining three years of the B.Com. programme. Students in the combined B.Com., C.A. programme are expected to register for 9 units during each of the combined spring and summer sessions.

(2) Not later than the end of the First Year in Commerce, students are expected to choose their field of concentration and thereafter follow the prescribed course of studies. Students are expected to consult the Chairman of the Division in which they intend to study to plan their specific programme. Transfers from one option to another may be made at the end of the Second Year, with the approval of the Dean.

(3) Students may be required to undertake field work in the business community.

(4) A small charge may be made for mimeographed material supplied by the Faculty for use in classes.

(5) A graduating essay is required, embodying the results of independent investigation. The topic selected requires the approval of the Dean. Before April 1 of the Third Year the counsellor for the essay must be chosen, and the essay topic approved.

(6) Students are advised to plan summer work, for at least part of their course, in the field of their option.

(7) All Second Year students, with the exception of those in option 10, are required to attend and complete, to the satisfaction of the Dean, a course in public speaking provided by the Faculty of Commerce and Business Administration.

Examinations

Examinations are held in December and in April. December examinations are held in all subjects of the First and Second Years, and are obligatory for all students. December examinations in subjects of the Third and Fourth Years, except in those subjects that are completed before Christmas, are optional with the Dean.

*Includes A.M.S. fee.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Standing and Credit

(1) Candidates in order to pass must obtain at least 50 per cent. in each subject; in a course which comprises both lecture and laboratory work, they will be required to pass in *both* the written examinations *and* laboratory work before standing in the course is granted. The grades are as follows: First Class, an average of 80 per cent. or over; Second Class, 65 to 80 per cent.; Pass, 50 to 65 per cent.

(2) Standing at graduation is determined by the average of the marks obtained in all courses of the Third and Fourth Years.

Supplementals

(1) If a student's general standing in the final examinations of any year is sufficiently high, the Faculty may grant him supplemental examinations in a maximum of 3 units. Notice will be sent to all students to whom supplementals have been granted.

(2) Students who have failed in more than 6 units of a required year's work will be considered to have failed in the work of the year, and will not receive credit for any of the courses passed in that year.

(3) Supplemental examinations, covering the work of both the first and second terms, will be held in August or September in respect of winter session examinations, and in July in respect of summer school examinations.

(4) Supplemental examinations may be written at the following centres: Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton,

Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made it will be \$5.00.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Unsatisfactory Standing

(1) A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to withdraw from the University; he may be re-admitted after a period of at least one year if his appeal to Senate is supported by the Committee on Admissions of the Faculty and upheld by Senate.

(2) Any student whose academic record, as determined by the tests and examinations of the first term, is found to be unsatisfactory may be required to discontinue attendance at the University for the remainder of the session.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "*unofficial*".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are

ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's Office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's Office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

OPTION REQUIREMENTS

Pre-Commerce

Students who have completed First Year Arts or First Year Science or its equivalent with standing in 15 units, including English 100 and Mathematics 110 or 120, will be admitted to any option other than 8 or 11. Students who contemplate admission to options 8 or 11 must have obtained standing in two First Year sciences, English 100, Mathematics 120, and also one elective.

Option No.	First Year Commerce
1 to 14	Com. 151, 190; Econ. 200; Eng. 200
1 to 7, 12, 13, 14	3 units of electives.*
8	3 units of Science.
9	Math. 202; or Math. 220 and 221.
10**	Educ. 200, 298. Electives are to be selected in consultation with the Head of the appropriate Division.

* Students are urged to consider a Mathematics Course of the 200 level.

** Skills in shorthand and typewriting are prerequisite to work that will be taken in the Third or Fourth Year. All Option 10 students who cannot demonstrate adequate skills are required to make up their deficiencies during their first or second years. Instruction will be provided on the campus without credit.

Option No.	Second Year Commerce
1 to 14	Com. 252 (or 253*), 261, 281; Econ. 304 or Math. 205; Public Speaking.
1 to 6, 8, 9, 12 to 14	3 units of electives.
1, 12, 14	3 units from Econ. 300 level course.
2, 5	3 units from Econ. 300; Soc. 200; Psych. 200 or 300 level course; Phil. 202.
3, 13	3 units from Econ. 300 level; Soc. 200; Psych. 200 or 300 level.
4, 7	3 units from Econ. 300 or 308.
6	Econ. 321.
7	Pol. Sc. 200.
8	3 units of Science or Mathematics.
9	Math. 300 and 305**.
10***	Educ. 332; Computer Science 200 and 201; Eng. 303.
11	For. 300; 3 units from Econ. 300 level course.

* Required for Accounting Option students.

** Credit may not be obtained for both Math. 305 and Math. 205 or Econ. 304.

*** Statistics and Public Speaking are not required in Option 10.

Accounting

Option 1

Third Year	Fourth Year
Commerce 331, 353, 354, 356, 371 6 units of electives*	Commerce 450, 451, 454, 455, 490, 492 3 units of electives*

Students are referred to J29 for the requirements of the professional accounting associations. Students are advised to take computer science courses in their third or fourth years. Commerce 432 may be taken in third year.

**Marketing
Option 2**

Third Year	Fourth Year
Commerce 331, 362, 363, 364, 365, 371 6 units of electives*	Commerce 467, 490, 492 3 units from Commerce 462, 463, 465, 466, 468 6 units of electives*

Students are encouraged to build upon courses in Economics, Psychology, or Sociology in their elective areas.

**Industrial Administration
Option 3**

Third Year	Fourth Year
Commerce 321, 331, 371, 383 6 units of electives*	Commerce 422, 483, 490, 492 6 units of electives*

Students may elect to specialize in the field of Operations Research if they have completed certain mathematics requirements in the first and second years. Those interested should consult the Chairman of this Division.

**Finance
Option 4**

Third Year	Fourth Year
Commerce 331, 371 Economics 310 3 units from Com. 307, 309, 372, 374, or 375 6 units of electives*	Commerce 475, 490, 492 4½ units from Com. 407, 471, 472, 473, 474, 476, or 495 6 units of electives*, 3 outside Commerce

**Transportation and Utilities
Option 5**

Third Year	Fourth Year
Commerce 331, 341, 343, 371 Economics 314 4½ units of electives*	Commerce 444, 445, 446, 490, 492, 494 4½ units of electives*

**Commerce and Economics
Option 6**

Third Year	Fourth Year
Commerce 331, 371 9 units of Economics including Economics 300 and 308 3 units of electives*	Commerce 490, 492 3 units from any 300 or 400 level Commerce courses 9 units from Economics 300 or 400 level courses

**Commerce and Public Administration
Option 7**

Third Year	Fourth Year
Commerce 321, 331, 371 Economics 310 Political Science 302 3 units of electives*	Commerce 490, 492 6 units from 300 or 400 level Political Science courses 6 units of electives*

**Commerce and Science
Option 8**

Third Year	Fourth Year
Commerce 331, 371 2 Science courses 6 units from 300 or 400 level courses in Commerce, Economics or Science	Commerce 490, 492 2 Science courses 6 units from 300 or 400 level courses in Commerce, Economics or Science

An additional course in Mathematics may be taken in the Second, Third, or Fourth Year in lieu of one of the sciences. The choice of courses in Science must be arranged with the department concerned and the standards required for entrance to Third and Fourth Year courses will be determined by that department.

**Commerce and Actuarial Science
Option 9**

Third Year	Fourth Year
Commerce 331, 371, 372, 374 Mathematics 301 6 units from any 300 or 400 level courses in Commerce, Economics, or Mathematics	Commerce 473, 474, 490, 492 Mathematics 302 or 305 6 units from any 300 or 400 level courses in Commerce, Economics, or Mathematics

**Commerce and Teaching
Option 10**

1. Students are not required to offer a teaching major other than Commerce.

2. Practice Teaching will be required in each year of the programme, except the Second Year. First Year: one half-day session each week as laboratory periods for Education 298. Third Year: two weeks' practicum after the April examinations. Fourth Year: one week in November; two weeks in February; two weeks after the April examinations.

Students may be required to do their post-examination practicum outside the Vancouver area.

Third Year	Fourth Year
Commerce 331, 376, 492 Educ. 301, 375, 498 3 units of electives*	Commerce 490 15 units of Education (including practicum)

**Commerce and Forestry
Option 11**

Third Year	Fourth Year
Commerce 331, 371, 458 Forestry 270, 278, 375 3 units from any 300 or 400 level course in Commerce	Commerce 490, 492 Forestry 272, 475, 476, 477 3 units from any 300 or 400 level course in Commerce, or Forestry 480 and 481

(No new enrolments will be accepted in this option beginning 1965-66.)

**Commerce and Law
Option 12**

Third Year	Fourth Year and Fifth Year
Commerce 371, 492 Commerce 494 or 355, 375 Political Science 300 level course 6 units of electives* (Commerce 331 and 337 are not allowed for credit)	Courses prescribed for First and Second years in the Faculty of Law of the University of British Columbia (See Faculty of Law calendar for admission requirements.)

**Industrial Relations
Option 13**

Third Year	Fourth Year
Commerce 321, 322, 324, 331, 371 6 units of electives*	Commerce 422, 425, 490, 492 6 units of electives*

Students are encouraged to follow a series of electives in each of their four years drawing on Psychology and Sociology courses. Electives in the Third and Fourth Years should be chosen in consultation with the Chairman of the Division.

**Estate Management
Option 14**

Third Year	Fourth Year
Commerce 307, 309, 337, 371, 372, 374 6 units of electives*	Commerce 407, 490, 492 Economics 310 Architecture 425 3 units of electives*

* Electives may be selected in consultation with the Chairman of the appropriate Division, from courses in Commerce, Economics, English, Geography, History, Political Science, Psychology, Mathematics, Science, or Sociology.

COURSES IN COMMERCE

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 151 (3) under Accounting indicates that Accounting 151 is a three-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 2 hours laboratory per week, both terms.	[2-2; 2-2]
1 lecture and 2 hours laboratory per week, first term.	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term.	[0-0; 1-2]

Note.—For descriptions of those courses taken outside the Faculty of Commerce, students should consult calendars of other Faculties. In particular, students are referred to: Economics 200, 300, 304, 308; English 200; Mathematics 201, 205; Psychology 100, 206; Sociology 200.

Estate Management

307. (1½) **Urban Land Markets.**—Economic characteristics of urban real estate market; nature of urban land use; city growth and development; locational factors in determination of land use; types of interest in land; government regulations affecting land ownership. [3-0; 0-0]

309. (1½) **Urban Land Investment.**—Investment policies in respect of freehold and leasehold urban property; institutional mortgage investments and characteristics of mortgage markets; economic aspects of building design. [0-0; 3-0]

407. (3) **Land Value and Valuation.**—Factors determining value; concepts of value; comparative study of methods of capital and rental valuation applied to freehold and leasehold interests in land (including construction and use of valuation tables); definition of value and valuation for mortgage and statutory purposes. [3-0; 3-0]

Industrial Relations

321. (3) **Organizational Behavior and Administration.**—A study of theory and practise in the effective design of organizational structures and problems of effective administration. The course will examine problems of work environment, motivation and morale and their influence on productivity. [3-0; 3-0]

322. (1½) **Labour Relations.**—An examination of the impact of trade unions on the management of industrial and commercial enterprises. This course will develop for the student of business administration an understanding of trade unions in Canada, their aims and objectives. Problems of public policy in the regulation of labour-management relations will be examined in detail. [3-0; 0-0]

323. (1½) **Industrial Relations.** (For Graduate Students only.)—A study of the problems of leadership motivation, and morale in industry. Particular attention will be directed towards the role of the personnel administrator in providing for the effective utilization of manpower resources in industry. [0-0; 3-0]

324. (1½) **Personnel Administration.**—An examination of problems and procedures involved in maintaining an efficient workforce, with particular emphasis on job analysis and job evaluation, wage and salary administration, employee selection, employee development and appraisal procedures, and

fringe benefit programmes. Case materials will be used to develop the student's ability to analyze employment problems and to develop effective personnel policies. [0-0; 3-0]

422. (3) **Collective Bargaining.**—The study of labour-management relations in the negotiation and administration of the collective agreement. The course will examine trends in collective bargaining; changing patterns of labour-management relations in adjusting to social, environmental and economic forces. Case materials will be used to develop an understanding of the bargaining processes and the administration of collective agreements. [3-0; 3-0]

425. (3) **Management of Human Resources.**—The examination of decisions, plans and policies formulated to ensure maximum development and utilization of human resources. Special attention will be given to problems of motivation and morale associated with changing technology. Materials will be drawn from a wide spectrum to provide a detailed understanding of diverse approaches to problems of manpower management. [3-0; 3-0]

Commercial Law

331. (3) **Commercial Law.**—Introduction to the law of contracts, with particular reference to contracts for the sale of goods (Sale of Goods Act) and related law of personal property; negotiable instruments (Bills of Exchange Act); elementary principles of agency; partnership (Partnership Act) and company law (B.C. Companies Act); examination of selected legal and commercial documents. [3-0; 3-0]

337. (3) **Contract and Land Law.**—Elements of law of contract as related to the sale of land; introduction to the law of land including the nature of land ownership; landlord and tenant; mortgages; governmental powers. [3-0; 3-0]

432. (1½) **Statute Law.**—Examination of selected statutes. [3-0; 0-0]

Transportation and Utilities

341. (3) **Business Logistics.**—The nature and interaction of the physical distribution functions are examined with special attention given to the characteristics of transportation. Methods of integrating and controlling the functions are studied with emphasis upon warehouse location, and the techniques of inventory control and linear programming.

342. (1½) **Transportation Policy.** (For Graduate Students only.)—The institutional setting of transportation. Economic, regulatory and management aspects. Review of physical distribution management. [3-0; 0-0]

343. (1½) **Public Utilities.**—A study of the special problems of government owned and government controlled businesses, with special reference to managerial, economic and regulatory aspects. Methods of organization, control of competition and price determination. [0-0; 3-0]

444. (1½) **Air Transportation.**—Development of Canadian air transport and public policy; airline management, air law and regulation; airline economics, with special reference to cost behaviour and demand for air transport; pricing. International Associations and agreements on factors affecting economical operations. [3-0; 0-0]

445. (1½) **Water Transportation.**—A study of the economic characteristics of ocean and inland water transportation. Special attention is given to the problems of government involvement in the shipping industry and to the problems of ocean shipping and its effects upon international trade. [0-0; 3-0]

446. (1½) **Highway Transportation.**—Development of highway transport, motor carrier economics, management, ratemaking and marketing of services. Problems in the regulation of motor carriers. Highway planning and financing for regional and national requirements. [0-0; 3-0]

Accounting

151. (3) **Fundamentals of Accounting.**—The analysis and communication of financial events and an examination of the accounting postulates underlying the preparation and presentation of financial statements. [2-2; 2-2]

252. (3) **Management Accounting.**—The basic concepts of management accounting and the use of accounting data in decision-making and in the management of an enterprise. The bases of interpreting financial statements emphasizing the impact of accounting postulates on interpretation. [3-0; 3-0]

253. (3) **Intermediate Financial Accounting.** (For Accounting Option students only.)—The development of an analytical framework for evaluating current financial accounting practices relating to the business firm. [3-0; 3-0]

352. (3) **Managerial Accounting.** (For Graduate students only.)—The use of figure data in making decisions and in appraising actual operating results of business enterprises. The course will include a study of fundamental accounting postulates, as applied in financial accounting, cost accounting, and budgeting. [3-2; 3-2]

353. (1½) **Advanced Accounting.**—Selected advanced topics in financial accounting. [3-0; 0-0]

354. (3) **Cost Accounting.**—Principles and methods of determining and controlling costs including the use of standards. [3-0; 3-0]

355. (1½) **Income Taxation.**—A study of income tax from the standpoint of business enterprise. [3-0; 0-0]

356. (1½) **Accounting Systems.**—The installation and operation of accounting systems in business organizations. [0-0; 3-0]

357. (2) **Accounting and Finance.** (Primarily for Forestry students.)—This course will give a foundation in basic accounting principles and elements of business finance. [2-0; 2-0]

358. (2) **Elements of Accounting.** (For Pharmacy students only.)—Accounting systems suitable for druggists' use; inventory records; departmental accounting; branch accounting; computation of losses and gains; elementary tax problems. [2-0; 2-0]

359. (2) **Accounting and Food Control.** (For Home Economics students only.)—An introduction to general accounting procedures, followed by application to particular problems encountered by the dietitian. (Given in 1967-68 and alternate years.) [2-0; 2-0]

450. (1½) **Accounting Problems.**—An examination of current problems and practices in Accounting. [0-0; 3-0]

451. (1½) **Accounting Theory.**—A critical examination of the principles and postulates of accounting theory underlying the determination of income. [0-0; 3-0]

454. (3) **Controls.**—A study of the position, function, and methods of operation of controls in administration and organization. Techniques used to effect control over delegated authority; budgeting, sales controls, production controls, asset control, and other control techniques. [3-0; 3-0]

455. (3) **Auditing.**—Internal control, legal and professional, responsibilities of the auditor; accepted auditing standards and procedures; preparation and presentation of reports and statements. [3-0; 3-0]

458. (2) **Cost Accounting.** (For Forestry students only.)—Principles of cost accounting and their use in the forest industry. [2-0; 2-0]

Marketing

261. (3) **Fundamentals of Marketing.**—A study of the basic considerations affecting the domestic and international marketing of goods and services. [3-0; 3-0]

361. (1½) **Merchandising and Distribution.**—(For Graduate students only.) A study of the methods used in the marketing of goods and services. Problems in merchandising, selection of channels of distribution, sales promotion, and pricing. [3-0; 0-0]

362. (1½) **Management of Promotion.**—An analysis of buyer behaviour; planning, controlling, and coordinating of the promotional functions of the firm. [3-0; 0-0]

363. (1½) **Marketing Institutions.**—A study of the concepts of product flow which form the bases for the development of intermediate marketing institutions in Canada; including a critical examination of institutional growth, change and operational management. [0-0; 3-0]

364. (1½) **International Marketing.**—An analysis of the bases of trade, international commercial policy, and other environmental factors which affect international marketing; followed by an investigation of the problems peculiar to the development and implementation of marketing strategy to serve international markets. [3-0; 0-0]

365. (1½) **Marketing Analysis.**—A study of quantitative methods of analysis applicable to the investigation of marketing problems; sources of market data; market tests; consumer research. [0-0; 3-0]

366. (1½) **Research Methods.**—The research process; methods of primary research; the formulation of a research design. (Not offered in 1966-67.) [3-0; 0-0]

369. (3) **Drug Store Retailing.** (For Pharmacy students only.)—Principles and practices involved in the organization and operation of the chain and independent drug store. Retail mathematics, credit, advertising, display, selling, public relations, personnel training. [3-0; 3-0]

462. (1½) **Promotion Problems.**—Campaign strategy; planning, organizing, and controlling an advertising programme. Advertising research and analysis. [3-0; 0-0]

463. (1½) **Institutional Marketing Problems.**—An investigation of current developments in both retailing and wholesaling fields and their application to marketing institutions. [0-0; 3-0]

465. (1½) **Marketing Research Problems.**—The application of research methods to problems in marketing; a study of selected techniques of measurement and analysis; the use of behavioural and quantitative models in marketing investigations. [3-0; 0-0]

466. (1½) **Industrial and Resource Marketing Problems.**—Managerial problems involved in marketing Canadian industrial commodities and basic resources; an examination through problem analysis of producer goods and the specialized channels of distribution through which they flow. [3-0; 0-0]

467. (3) **Marketing Management.**—A study of managerial decision-making with particular emphasis on product planning and market analysis; distribution policies, methods and procedures; pricing and sales policies; and governmental regulation of marketing processes. [3-0; 3-0]

468. (1½) **International Marketing Management.**—An analysis of the scope and significance of contemporary international business operations

with particular reference to the marketing management problems encountered by firms with multi-national branches and subsidiaries. [0-0; 3-0]

Finance

371. (3) **Business Finance.**—Problems of financing business concerns, including promotion, types of organizations, provision of long-term and short-term capital, dividend policy, expansion and combination, involvements, public policy toward corporations. Assigned readings. Prerequisites: Commerce 151 and Economics 200. [3-0; 3-0]

372. (1½) **Life Insurance and Personal Risk.**—The study of the nature and application of life insurance and annuities; life contingencies; mortality tables; legal aspects. Health, group benefits, pensions and social security. [3-0; 0-0]

373. (1½) **Business Finance.** (For Graduate students only.)—Types of business organization; problems of financing; provision of short-term and long-term capital; expansion and combination; public policy. [0-0; 3-0]

374. (1½) **Insurance and Risk Management.**—Nature of risk and uncertainty; methods of meeting risk; the insurance mechanism; legal problems of insurance; various types of contracts and carriers. [0-0; 3-0]

375. (1½) **Tax and Estate Planning.**—Income tax and succession duty laws are examined against the background of a number of cases designed to illustrate current estate planning practice. The value of life insurance and alternative investments is considered and several forms of property interests are discussed in detail. [0-0; 3-0]

471. (1½) **Theory of Finance.**—A study of the theory of resource allocation in the firm. The problems of applying models to financial planning. [3-0; 0-0]

472. (1½) **Financial Management.**—Advanced problems of financial management from internal point of view. Debt policy and capital structure planning; capital costs and capital budgeting, dividend policy, valuation, mergers and acquisitions; public policy. [0-0; 3-0]

473. (1½) **Security Analysis.**—Analytical techniques for the appraisal of corporate and government securities; security price movements; sources and interpretation of information; technical characteristics of stock markets. [3-0; 0-0]

474. (1½) **Investment Policy.**—The management of security portfolios for individual and institutional investors; relation of investment policy to money markets and business fluctuations. [0-0; 3-0]

475. (1½) **Financial Institutions.**—An introduction to the capital market in Canada; a study of the policies and practices of institutions engaged in mobilizing funds for medium and long-term investment. [3-0; 0-0]

476. (1½) **International Financial Institutions.**—A study of the policies and practices of the leading international financial institutions which have emerged since World War II, such as: the International Bank for Reconstruction and Development, International Monetary Fund, International Finance Corporation, and the International Development Association. [0-0; 3-0]

Industrial Administration

281. (3) **Fundamentals of Production.**—A study of the problems encountered and the techniques used in establishing and managing a manufacturing organization. [3-0; 3-0]

381. (1½) **Industrial Organization.** (For Graduate students only.)—A survey of the management functions involved in establishing and operating a business with particular reference to manufacturing. [3-0; 0-0]

382. (1½) **Materials Control.**—A detailed study of the principles and practices involved in establishing standards and procedures for the control of quantity and quality of materials in manufacturing processes. [0-0; 3-0]

383. (3) **Work Analysis.**—A detailed study of the methods of analyzing work situations and productivity in factories, offices, and other commercial enterprises. The areas of work measurement, methods analysis, quality control, and layout planning will be critically examined. Laboratory assignments and field work. [2-2; 2-2]

384. (2) **Industrial Management.** (For Forestry and Agriculture students only.)—A survey of industrial management principles, problems, practices, and procedures. [2-0; 2-0]

483. (3) **Planning and Control Problems.**—Advanced problems in planning and controlling work operations with special emphasis on quantitative analysis. Case and field work problems. [3-0; 3-0]

Management and Policy

190. (3) **Fundamentals of Business.**—Introduction to the basic concepts and techniques of business functions and organization. [3-0; 3-0]

490. (3) **Essay.**—Students will be required to submit an essay on a selected business topic.

492. (3) **Policy and Administration.**—Case diagnosis and remedial measures. In this course the student is expected to apply the principles and techniques acquired in the basic courses to comprehensive problems. Extensive references. Verbal and written reports. [3-0; 3-0]

494. (3) **Government and Business.**—An examination of federal and provincial regulation of the economic system. Critical analysis of combines investigation legislation, price maintenance, loss leaders, patent policy, industrial and corporate concentration, measurement and maintenance of competition. [3-0; 3-0]

495. (1½-3) **Selected Topics in Quantitative Analysis.**

Commerce Courses in Teacher Education

(Open to students for credit towards the B.Ed. degree and Option 10 only as indicated)

90. (3) **Typewriting Techniques, Practice and Methods.** (Not offered after the 1965/66 session.)

101. (3) **Shorthand Techniques, Practice and Methods.** (Not offered after the 1965/66 session.)

201. (3) **Secretarial Practice.** (Not offered after the Summer Session of 1967. See Education 375 for substitute course.)

376. (3) **Personal and Business Finance.**—An examination of the instruments of business and personal finance and a study of the methods of presenting these topics to high school students. Forms and instruments of business finance, life insurance, banking, investments, general insurance, real estate. Special project assignments. Field trips. Credit for B.Ed. or B.Com. [3-0; 3-0]

391. (3) **Office Management.** (Not offered after the Summer Session of 1967. See Education 375 for substitute course.)

Graduates Courses

507. (1½) **Seminar in Contemporary Land Investment Problems.**—Studies in investment problems principally from the viewpoint of the individual landowner; uses of building economic analysis in cost design of buildings; influence of income tax and estate duties in investment decisions; critical study of the computation of investment returns; methods of market analysis for investment purposes.

508. (1½) **Seminar in Government Policy in Relation to Urban Land Ownership.**—Urban redevelopment policies; community planning and other forms of police power; landlord and tenant legislation; mortgage policies; taxation; expropriation.

509. (1½) **Seminar in Mortgage Financing.**—Advanced problems arising in the mortgage money market. Emphasis on contemporary problems of flow of mortgage funds. Comparative study of government and institutional policies.

520. (1½) **Organizational Behavior and Administration.**—An examination of problems and issues in the administration of human resources in business organizations. The course will concentrate on specific behavioral and attitudinal problems which face the practicing manager. Concepts, theory and research from various social sciences will be presented in analyzing determinants of and possible solutions to the problems.

521. (1½) **Theory, Research and Methodology in the Study of Organizational Behavior.**—An attempt to identify and integrate various theoretical frameworks utilized in the study of behavior in business organizations. Major empirical research findings will be reviewed in the light of the theoretical viewpoints discussed. Concomitantly, key methodological approaches and problems in behavioral research in business organizations will be illustrated.

522. (1½) **Selected Problems in Labour Relations.**—An examination of contemporary problems of labour relations, with particular emphasis on public policy issues, conciliation, and arbitration procedures, the process of labour-management accommodation to technological change, the status of unions in society and their impact on the management of industrial and commercial enterprises.

523. (1½) **Seminar in Labour Relations.**—An examination of major research findings in selected areas of labour relations with particular reference to the growth and potential of labour unions, their impact on management, disputes settlement, public policy issues in labour-management relations, and internal union structure.

544. (1½) **Seminar in Transportation.**—A study of current transportation conditions and problems. Territorial freight rate adjustments. Regulation of competition. Coordination of transportation facilities.

545. (1½) **Seminar in Transportation Development Economics.**—Problems in economic development including benefit-cost analysis; user-cost recovery; entry control; cooperation with neighboring states; transportation planning.

549. (3-6) **Master's Thesis.**—A comprehensive treatment of some theoretical or institutional problem.

551. (1½-3) **Advanced Accounting Seminar.**—The examination of selected areas in accounting.

552. (1½) **Seminar in Income Determination.**—An examination of the essential characteristics of business income, and the various unsettled issues in its calculation.

553. (1½) **Seminar in Accounting Standards.**—An examination of the accounting standards recommended by professional accounting bodies in Canada, the United States, and the United Kingdom—a comparison of the recommendations and a study of their impact on accounting.

554. (1½) **Seminar in the Controllership Function.**—The place of the controller in the business enterprise and his responsibility for financial planning and control.

555. (1½) **Seminar in Data Processing.**—The processing of business data; manual, tabulating, and the electronic data-processing systems.

556. (1½) **Seminar in Advanced Managerial Accounting.**—Studies of managerial tools of budgeting, costing for decision-making.

562. (1½-3) **Seminar in Marketing Management.**—A comprehensive analysis of certain aspects of administration and policy as related to marketing.

564. (1½) **Seminar in Current Marketing Problems.**—A survey of current marketing problems and their implications.

566. (1½) **Seminar in International Marketing.**—A study of the management of international marketing activities as performed by the individual firm. The seminar will deal with the foreign marketing of exported products and/or the products of overseas affiliates. Emphasis is placed on the policy and strategy formulation for the firm's international marketing efforts, and on the organization and administration of the firm's resources for accomplishing its international marketing objectives.

568. (1½) **Seminar in International Business.**—A comparative study of the business and marketing systems employed in selected nations of the world. The seminar will deal with the relationships between business and marketing practice and the socio-economic environments of these nations.

571. (1½) **Seminar in Financial Institutions.**—A study of the functional processes of monetary and non-monetary financial institutions participating in the market for financial assets. The seminar will deal with the implemental aspects of monetary policy and be concerned with the various attempts made to develop a theory of financial institutions.

575. (1½) **Seminar in Security Analysis.**—Studies of recent research in principles and techniques of security analysis; valuation of securities; analysis of investment risks; use of statistical techniques in security selection. Review of theories on security price movements.

576. (1½) **Seminar in Investment Management.**—Policies and practices of institutional investors. Quantitative analysis of security and real estate investments. Market behaviour.

577. (1½) **Seminar in Financial Management.**—Policies and practices of corporate financial management. Capital expenditures. Regulatory influences.

579. (1½) **Seminar in Insurance and Risk Management.**—Studies of the theory of risk, risk bearing and insurance within the framework of management decision-making. Specific topics to be dealt with will include: risk analysis; methods of meeting risk with attention given to special problems, e.g. those arising out of consolidations and foreign operations; employee group benefits; the financial aspects of social security; business life insurance; and the relationships between insurance and government.

580. (1½) **Seminar in Production.**—Readings and research in new techniques in manufacturing and production control.

590. (1½-3) **Research in Business Administration.**—Directed research in a selected area of business administration. Admission on the recommendation of the students' advisory committee.

591 (1½) Seminar in Business Policy.—A study of policy-making in business, government, and social fields.

592. (1½) Seminar in Business Administration. — An examination of present-day thinking and research in the field of business administration.

PROFESSIONAL ASSOCIATIONS

1. Institute of Chartered Accountants of B.C.

(a) Graduates of the Accounting Option will be exempted from the Intermediate Uniform Examinations of the Institute. The candidates enter the Fourth Year course of the Institute and are required to serve two years under Articles.

(b) Graduates with the degree of B.Com. other than in the Accounting Option are exempted by the Institute from the Primary Examination of the Institute and are required to serve three years under Articles. They are eligible to write the Intermediate Uniform Examination within a year from the commencement of training with the Institute.

(c) Combined programme for Chartered Accountants and degree of B.Com. See page J11.

2. Certified General Accountants Association of B.C.

(a) Graduates of the five-year B.Com. programme will be granted exemption from the First and Second Year examinations of the Association and the period of required practical experience will be reduced to thirty-six months.

(b) Graduates with the degree of B.Com., Accounting Option, will be granted exemption from the First, Second, and Third Year examinations of the Association. The period of required practical experience will remain at thirty-six months.

3. Society of Industrial and Cost Accountants of B.C.

(a) Graduates of the five-year B.Com. programme, Accounting Option, will be granted exemption from the following courses of the Society's programme of studies leading to the R.I.A. designation: Accounting I, Accounting II, Accounting III, Fundamentals of Cost Accounting, Managerial Statistics, and Industrial Organization and Management. They will be required to take the following courses: Advanced Cost Accounting, Accounting IV, Report-Writing, Industrial Legislation, and will be required to write a Thesis.

(b) Graduates of the five-year B.Com. programme, any option (other than accounting), will be granted the following minimum exemptions: Accounting I, Managerial Statistics, and Industrial Organization and Management. Additional exemptions will be granted, upon application to the Society, to the extent that comparable courses have been completed at the University.

(c) A period of practical experience is required to qualify as a registered member of the Society.

4. Provincial Department of Education of B.C.

Graduates of the Commerce and Teaching option (option 10) will be recommended to the Provincial Department of Education of British Columbia for the Professional Basic Teaching Certificate.

5. Real Estate Institute of B.C.

Graduates of the B.Com. programme, Estate Management Option (option 14), will be admitted to the professional membership division without further examination and the period of required practical experience will be reduced from five years to two years.

PROFESSIONAL AND DIPLOMA COURSES

The Faculty organizes and operates programmes in a number of professional and technical fields, as set out below. Each programme requires detailed study over a period of several years, regular attendance at classes (or correspondence lessons, where specified), completion of assignments, and annual examinations in the subject matter of the year.

Admission requirements vary from programme to programme. Registration is limited to residents of this Province. Requests for information should be addressed to the appropriate course co-ordinator in the Faculty list in the first part of this Calendar.

1. **Certified General Accountants.** A five-year programme, designed to meet the academic requirements for the C.G.A. Certificate of British Columbia. Lectures and Correspondence.
2. **Chartered Accountants.** A five-year programme designed to meet the academic requirements for membership in the Institute of Chartered Accountants of British Columbia. Lectures and Correspondence.
3. **Registered Industrial Accountants.** A five-year programme designed to meet the academic requirements for the R.I.A. Certificate. Lectures.
4. **Junior Management.** A three-year programme. Lecture courses in Marketing, Industrial Organization, and Finance.
5. **Municipal Administration.** A four-year programme for persons employed in Municipal Administration. Correspondence lessons and Spring Institute. Junior Diploma on completion of First and Second Years; Senior Diploma on completion of Third and Fourth Years.
6. **National Office Managers.** A three-year programme, designed to meet the academic requirements for the C.O.A. Certificate of British Columbia. Lectures.
7. **Real Estate and Appraisal.** A three-year programme given by correspondence and lectures.
8. **Sales Management.** A three-year programme. Lectures.

**THE FACULTY OF
DENTISTRY**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Dentistry calendar, 1966-67

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FACULTY OF DENTISTRY
ACADEMIC STAFF

S. WAH LEUNG, B.Sc., D.D.S. (McGill), Ph.D. (Rochester), F.A.C.D., Professor of Oral Biology and Dean of the Faculty.

Department of Oral Biology

S. WAH LEUNG, B.Sc., D.D.S. (McGill), Ph.D. (Rochester), F.A.C.D., Professor.

LEON KRAINTZ, A.B. (Harvard), M.A., Ph.D. (Rice Inst.), Associate Professor.

JOHN D. SPOUGE, M.D.S. (Sheffield), F.D.S., R.C.S. (Eng.), M.R.C.S. (Eng.), L.R.C.P. (London), Associate Professor.

DAN G. MIDDAGH, B.A., D.D.S. (Minn.), Assistant Professor.

Department of Oral Medicine

GILBERT J. PARFITT, F.D.S., R.C.S. (Eng.), M.R.C.S., L.R.C.P. (Guy's), D.M.D. (Alabama), Professor and Head of the Department.

DAVID G. GARDNER, D.D.S. (Toronto), M.S.D. (Indiana), Assistant Professor.

ROLAND W. LAUENER, M.D. (Brit. Col.), F.R.C.P.(C), Assistant Professor (Part-time).

Department of Oral Surgery

HAMILTON, E. SIMMONS, D.M.D. (North Pacific), Lecturer (Part-time).

Department of Orthodontics

RICHARD M. JACOBS, Dr. med-dent. (Munich), D.D.S. (New York), M.P.H. (California), Ph.D. (Virginia), M.S. (Illinois), Associate Professor and Head of the Department.

Department of Public and Community Dental Health

DOUGLAS J. YEO, D.D.S. (Toronto), M.P.H. (Michigan), Associate Professor and Head of the Department.

H. KNOWLTON BROWN, D.D.S. (Alta.), D.D.P.H. (Toronto), LL.D. (Alta.), F.A.C.D., Lecturer.

Department of Restorative Dentistry

RICHARD H. ROYDHOUSE, B.D.S. (New Zealand), M.S. (Rochester), Assistant Professor.

TREVOR J. HARROP, L.D.S. (Glasgow), D.D.S. (Dalhousie), M.S., Ph.D. (Iowa), Assistant Professor.

Department of Anatomy*

SYDNEY M. FRIEDMAN, B.A., M.D., C.M., M.Sc., Ph.D. (McGill), F.R.S.C., Professor and Head of the Department.

PARIS CONSTANTINIDES, M.D. (Vienna), Ph.D. (Montreal), Professor.

CONSTANCE L. FRIEDMAN, M.Sc., Ph.D. (McGill), Research Associate Professor.

JOSEPH A. M. HINKE, M.D. (Brit. Col.), Associate Professor.

JOSEPH M. ODIORNE, Ph.D. (Harvard), Associate Professor.

KENNETH R. DONNELLY, B.A., M.D. (Brit. Col.), Assistant Professor.

CARL T. FRIZ, Ph.D. (Minnesota), Assistant Professor.

WILLIAM A. WEBBER, M.D. (Brit. Col.), Assistant Professor.

Department of Biochemistry*

MARVIN DARRACH, M.A. (Brit. Col.), Ph.D. (Toronto), Professor and Head of the Department.

WILLIAM J. POLGLASE, M.A. (Brit. Col.), Ph.D. (Ohio State), Professor.

SIDNEY H. ZBARSKY, B.A. (Sask.), M.A., Ph.D. (Toronto), Professor.

CHARLES T. BEER, D.Phil. (Oxon.), A.R.I.C., F.R.I.C. (M.R.C. Associate), Associate Professor.

GORDON HENRY DIXON, B.A. (Cantab.), Ph.D. (Toronto), Associate Professor.

P. HARRY JELLINCK, B.A. (Cantab.), B.Sc., M.Sc., Ph.D. (London), Associate Professor.

VINCENT J. O'DONNELL, B.Sc., Ph.D. (McGill), Associate Professor.

MICHAEL SMITH, B.Sc., Ph.D. (Manchester), Associate Professor (Part-Time).

GORDON M. TENER, B.A. (Brit. Col.), M.S., Ph.D. (Wisc.), (M.R.C. Associate), Associate Professor.

JAMES F. RICHARDS, M.A. (Queen's), Ph.D. (West. Ont.), Assistant Professor.

PHILIP D. BRAGG, B.Sc., Ph.D. (Bristol), (M.R.C. Scholar), Assistant Professor.

ALBERT F. BURTON, B.Sc. (Man.), M.Sc. (West. Ont.), Ph.D. (Sask.), Assistant Professor.

Department of Pathology*

HAROLD E. TAYLOR, M.D., C.M. (Dalhousie), F.R.C.P. (Edin.), F.R.C.P.(C), Professor and Head of the Department.

R. H. PEARCE, M.Sc., Ph.D. (West. Ont.), Associate Professor.

P. S. VASSAR, M.B., B.S. (London), Associate Professor.

W. H. CHASE, B.Sc., M.D., C.M. (McGill), Associate Professor.

RALPH SPITZER, A.B. (Cornell), Ph.D. (Cal. Tech.), M.D. (Man.), Associate Professor.

DAVID HARDWICK, M.D. (Brit. Col.), Assistant Professor.

JANG D. OH, M.D. (Severance Medical College, Seoul), Ph.D. (Washington), Assistant Professor and Lederle Medical Faculty Award.

WILLIAM L. DUNN, B.Sc., M.D. (West Ont.), Ph.D. (London), Assistant Professor.

C. F. A. CULLING, F.I.M.L.T. (London), Instructor.

Department of Pharmacology*

JAMES G. FOULKS, B.A. (Rice), Ph.D. (Johns Hopkins), M.D. (Columbia), Professor and Head of the Department.

GORDON E. DOWER, M.R.C.S. (England), L.R.C.P. (London), M.B., B.S. (London), Associate Professor.

GEORGE I. DRUMMOND, M.Sc. (Alta.), Ph.D. (Wisc.), Associate Professor.

THOMAS L. PERRY, A.B. (Harvard), B.A. (Oxon.), M.D. (Harvard), Associate Professor.

FLORENCE PERRY, M.Sc. (Dalhousie), Ph.D. (Toronto), Assistant Professor.

HARVEY D. SANDERS, B.S.P., M.S.P. (Brit. Col.), Ph.D. (Manitoba), Assistant Professor.

Department of Physiology*

D. HAROLD COPP, B.A., M.D. (Toronto), Ph.D. (Calif.), F.R.S.C., Professor and Head of the Department.

EDGAR C. BLACK, M.B.E., B.A. (McMaster), M.A. (Brit. Col.), Ph.D. (Pennsylvania), F.R.S.C., Professor.

HUGH MCLENNAN, M.Sc., Ph.D. (McGill), Professor.

ROBERT L. NOBLE, M.D. (Toronto), Ph.D., D.Sc. (London), F.R.S.C., Professor.

CARL F. CRAMER, M.S. (New Mexico), Ph.D. (Calif.), Associate Professor.

JOHN W. JULL, B.Sc., Ph.D. (Leeds), Associate Professor.

JOHN C. BROWN, B.Sc. (Durham), Ph.D. (Newcastle), Assistant Professor.

EUGENE CUTHBERT CAMERON, M.D. (Brit. Col.), Instructor.

Lecturers from Other Departments

Donald O. Anderson, B.A., M.D. (Brit. Col.), S.M. in Hyg. (Harvard), F.R.C.P. (C), Associate Professor, Department of Preventive Medicine.

I. D. Desai, I.D.D., B.S., M.S. (India), Ph.D. (Calif.), Research Associate, Department of Biochemistry.

**Departments of the Faculty of Medicine.*

FACULTY OF DENTISTRY

The Faculty of Dentistry was established in 1962 as the result of two detailed surveys of the need for dental education facilities in the Province of British Columbia, conducted in 1955 and 1961 by Dr. John B. Macdonald. The reports of these surveys have been published under the titles, "A Prospectus on Dental Education" and "Dental Education in British Columbia", respectively. These reports clearly demonstrated the need for a Faculty of Dentistry in the Province and strongly recommended that such a Faculty be established at the University of British Columbia. The Dean of the new Faculty was appointed in July, 1962, and a small class of undergraduate dental students was admitted in September, 1964.

Objectives

The undergraduate dental programme consists of four years of professional study, leading to the degree of Doctor of Dental Medicine (D.M.D.).

The specific objective of the academic programme is to prepare dentists who will be able to practise their profession with a high degree of technical skill and competence based upon a sound understanding of the fundamental principles of basic biological sciences which underlie the practice of dentistry, and possessed of a deep insight into their social, professional and ethical responsibilities to the community at large. It is intended that the graduating dentist shall have the necessary scientific and technological foundation to begin the practice of modern dentistry, but not that he should be completely knowledgeable in all phases of dental science and dental art. It is hoped to impart to students the concept that graduation is but a beginning step in their professional education and that this educational process must be continued throughout their professional careers through graduate study, post-graduate and continuing education courses, and programmes of self-study.

Admission Requirements

Admission to the Faculty of Dentistry is based primarily on academic ability and personal qualities as evidenced by pre-dental scholastic records, aptitude tests, letters of recommendation, and personal interviews. Since facilities for pre-clinical and clinical instruction are limited, enrolment must, of necessity, be restricted to those who, in the opinion of the Faculty, are best qualified to meet the mental and physical demands of the curriculum and most likely to be able to complete successfully the full course of study. The fulfilment of the minimum requirements for admission should not be regarded as assurance that the applicant will automatically be accepted.

Application forms and information regarding pre-dental requirements, tuition and fees may be obtained from the office of the Dean, Faculty of Dentistry, The University of British Columbia, Vancouver 8, B.C.

Predental Requirements

The requirements listed below apply to the student taking his pre-dental work in the Faculty of Arts or the Faculty of Science at the University of British Columbia. An applicant from another university must submit evidence of having successfully completed equivalent prerequisite courses: English 100 (Literature and Composition); Mathematics 120 (Algebra, Geometry, Trigonometry and Calculus); Chemistry 110 or 101 or 102 (General), Chemistry 200 (Analytical, Inorganic and Physical), or Chemistry 205 (Inorganic and Analytical), Chemistry 203 or 230 (Organic); Physics 101 or 110 or 103 (Elementary); Biology 101 or Zoology 105 (General).

The student should select other courses to conform with the requirements for a baccalaureate degree. It is strongly recommended that there be a fair representation of courses in the Humanities and Social Sciences in the student's programme of study.

Candidates for admission to the Faculty of Dentistry should have completed the equivalent of three academic years in the Faculty of Arts or Faculty of Science at the University of British Columbia. A minimal scholastic average of 65% or Second Class standing, based upon the system of grading used at The University of British Columbia, is required.

Students from the United States are required to take the American Dental Association Dental Aptitude Test before admission. Address inquiries concerning these tests to The Division of Educational Measurements, Council on Dental Education, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. At the time of the test the student should request that the scores be sent to the Admissions Committee, Faculty of Dentistry, University of British Columbia, Vancouver 8, B.C.

The successful applicant is required to submit a deposit of \$100 within two weeks of notification of his acceptance by the University. This deposit is non-refundable and shall be applied toward the tuition of the first term of the session for which the student had been accepted.

Registration

The academic year of the Faculty of Dentistry begins on the Tuesday after Labour Day. Candidates who have been accepted for admission to the Faculty of Dentistry should report to the Administration Office of the Faculty between 9:00 a.m. and 12 noon on the day of registration. Failure to complete registration on the designated day will render the student liable for a late registration fee of \$25.00. No student will be allowed to register after the first day of instruction in the term, nor will he be admitted to any class after its first meeting, except by permission of the Dean.

Fees—*Subject to change without notice*

First Term Fees, \$351 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$673 at time of registration.

Second Term Fees, \$322, are payable in full on or before the first day of lectures in the second term. Students should mail cheques for the second term fees to the Accounting Office before this date with a note showing name and registration number.

Instruments and Supplies

Information regarding textbooks will be given at the first class period in each course. Not less than \$100 per year should be available for purchasing textbooks and expendable supplies.

The following instruments and supplies will be required during the first year of instruction. It is recommended that no purchases be made until details are furnished by the departments concerned.

	Approximate Price
Instruments for anatomy and physiology	\$ 10.00
Laboratory coats (4)	\$ 20.00
Dental Instruments — First Year	\$125.00
— Second Year	\$475.00
— Third Year	\$475.00

Attendance

1. Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

2. Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

3. Unavoidable absence of one day or less for reasons other than sickness must be explained to the instructor or instructors concerned when the student returns to classes. If the absence is for longer than one day, he must arrange for readmission through the Dean's office.

4. A student *planning* to be absent from classes for *any reason* must obtain previous permission from the Dean's office.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Faculty reserves the right to require a student to withdraw from the Faculty at any time if, in the opinion of the Faculty he is unsuited because of academic or other reasons, to proceed with the study or enter the profession of dentistry.

Examinations

1. Examinations in the Faculty of Dentistry may be held at various times throughout the year. These examinations are obligatory for all students.

2. Should a student find that he will be unavoidably absent from a sessional examination, he or someone familiar with his situation must notify the Dean's office of the facts in the case before the end of the period during which the examination is scheduled. Failure to observe this rule may result in a failure being recorded in the course.

3. When a sessional examination has been missed through illness or some other justifiable cause, application for deferred examination or special consideration must be made in writing to the Dean as soon as possible after the close of the examination period. If the absence was for reasons of health, a physician's certificate indicating the nature and duration of the illness must be submitted to the University Health Service.

4. A student may be denied the privilege of writing a sessional examination in any subject because of unsatisfactory work or attendance, and in this case he will be considered to have failed in the course.

5. In any course which involves both laboratory work and written examinations, a student is required to make satisfactory standing in both parts. If the course is repeated, no exemption will ordinarily be granted from the work in either part.

6. Term essays and examination papers may be refused a passing mark if they are illegible or noticeably deficient in English.

7. The passing mark in the Faculty of Dentistry is 60%. Examinations will be graded as follows: First Class, 80% or over; Second Class, 65%; Pass, 60%.

8. All results of final examinations will be passed by the Promotions Committee and approved by Senate. Release will be made by the Registrar. Final examination results will not be communicated through any other channel.

Advancement

1. The Faculty will determine the student's fitness for promotion at the end of each session. No student with defective standing will be promoted.

2. A student whose academic standing is unsatisfactory may be required either to withdraw from the Faculty or to repeat the entire work of the year.

3. If the progress of a student has been unsatisfactory in any given session, the Faculty may permit a supplemental examination in the subject failed provided: (i) his attendance has been satisfactory; (ii) he has not failed in more than two subjects; and (iii) he has an average of at least 60% in the work of the year including the failed subjects. The department or departments concerned may direct such work as will be necessary to prepare for the supplemental examination. It is the responsibility of the student to consult the heads of the departments concerned about such arrangements. If the student satisfies the requirements of the departments concerned and passes each supplemental examination with a mark of at least 65% he will be promoted. All supplemental examinations must be taken at the University.

4. A student in the First Year who fails to be promoted will not be permitted to repeat the year except under special circumstances.

5. A student who fails for a second time in University studies is required to withdraw.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the dead-line.

Re-reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of Christmas or mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Courses of Instruction

The following courses are required of students in the First Year:

Anatomy

400, 401. **Human Anatomy (Dentistry).**—A correlated course of study of the structure of the human body including gross, microscopic and radiological anatomy and embryology for students of Dentistry.

Biochemistry

400. **General Biochemistry.**—A laboratory and lecture course dealing with the chemical and physical chemical phenomena underlying the functioning of the normal human body. Both terms.

Oral Biology

410. **Dental Morphology.**—A lecture and laboratory course dealing with the form, structure and function of the human dentition.

Physiology

400. **Human Physiology.**—A lecture and laboratory course on body function with particular reference to human physiology. The functions of muscle, nerve, central nervous system, special senses, metabolism, circulation, respiration, excretion, digestion, and the endocrines are dealt with.

Preventive Medicine

400. **Introduction to Medical Statistics.**—A survey course by lecture and demonstration of the fundamentals, functions and limitations of statistical methods as applied to the Health Sciences. Textbook: Bancroft, *Introduction to Biostatistics*.

Restorative Dentistry

411. **Methods and Materials.**—A lecture and laboratory course introducing the methods and materials used to restore and replace tooth structure and function.

The following courses are required of students in Second Year:

Anatomy

425. **Elements of Neuroanatomy.**—An introduction to the structure of the human nervous system. First term. Textbooks: Ransom, Clark, *Anatomy of the Nervous System* or Strong, Elwyn, *Human Neuroanatomy*. Given only in conjunction with Physiology 425.

Microbiology

425. **Medical Microbiology.**—Morphologic and cultural characteristics of bacteria, viruses and fungi pathogenic for man. Offensive properties of microorganisms and defensive mechanisms of the body. Disinfection and sterilization. Chemotherapeutic agents. Discussion of epidemiologic features, sources of infection, modes of transmission, prevention, specific treatment and laboratory diagnostic procedures of human infectious diseases.

Oral Biology

420. **Principles of Occlusal Function and Articulation.**—A course of lectures, demonstrations and laboratory exercises concerned with the function of the teeth and associated structures, and the principles of articulation and occlusal function as a basis for clinical treatment.

423. **Pathology of the Oral Tissues.**—Lectures, laboratory and demonstrations emphasizing the gross and microscopic changes occurring in the structures of the oro-facial region associated with diseases of the soft and hard tissues. During the first nine weeks, students will attend classes in Human Pathology 425 in the Faculty of Medicine, covering the basic principles of general pathology. The dental students will also participate in autopsy demonstrations and clinical pathological conferences.

Oral Medicine

425. **Oral Medicine and Diagnostic Procedures.**—Lectures and clinics on the recognition of and treatment planning for diseases affecting the oral structures.

Oral Surgery

426. Principles of Oral Surgery and Anaesthesiology.—Lectures and clinics emphasizing the principles underlying common procedures in minor oral surgery, and the associated use of local anaesthetics.

Orthodontics

429. Introduction to Orthodontics.—The course is designed to expose the student to broad, basic biological concepts underlying the orthodontic science.

Pharmacology

425. Medical Pharmacology.—A lecture and laboratory course covering the fundamental pharmacological actions of drugs.

Physiology

425. Elements of Neurophysiology.—An introduction to the functions of the nervous system: First Term. Given only in conjunction with Anatomy 425.

Public and Community Dental Health

427. Professional Development.—This course will trace the development of Dentistry as a health profession, and identify the major contributors to the science, art, and principles of professional service, and the nature and significance of their contribution. Emphasis will be placed on the changing concepts of dental health and dental practice, particularly as these relate to professional and ethical attitudes and responsibilities.

Restorative Dentistry

421. Methods and Materials.—A course using programmed instruction, seminars and technical exercises in methods and materials used to restore and replace tooth structure and function.

422. Introduction to Clinical Restorative Dentistry.—Lectures and clinical demonstrations of the principles and methods used to restore oral tissues to proper function.

The following courses are required of students in the Third Year:

Medicine

435. General Medicine.—Systematic lectures and clinics covering medical disorders and the correlation of disordered function and anatomical changes with symptoms and signs, with particular emphasis on medical conditions related to dentistry. Application of basic medical sciences to clinical medicine is stressed.

Oral Biology

430. Oral Biology.—Lectures, seminars and laboratory demonstrations designed to illustrate and emphasize the relation between the biomedical sciences and clinical practice.

Oral Medicine

434. Periodontology.—A series of lectures on structure, function and diseases affecting the periodontal tissues; diagnosis, prevention and treatment. Clinical instruction is given in diagnostic procedures and surgical techniques. The underlying principles of treatment are stressed.

435. Oral Medicine and Oral Diagnosis.—Systematic lectures and clinics dealing with those diseases which affect the oral structures including neoplasms and developmental, hormonal, metabolic and nutritional disorders.

A series of lectures on the diagnosis of oral disease: the diagnostic procedures of history taking, clinical examination, x-ray examination and interpretation, laboratory procedures, drugs and pharmaceuticals used in dentistry, and the role of biomedical sciences in the understanding of the clinical condition.

As clinical clerk, the student will receive instruction and gain experience in the taking of case histories, the examination of patients, the use and interpretation of x-rays and laboratory tests.

Oral Surgery

436. Oral Surgery.—Lectures, demonstrations and clinical instruction in the basic principles of oral surgery and the use of local anesthetics. Students will participate in performing oral surgery of a minor nature, including simple exodontia.

Orthodontics

439. Interceptive Orthodontics.—The course is designed to explore with the student the multiplicity of development events and growth factors which determine the broad spectrum of morphological pattern and physiological characteristics of cranio-facial complex, with a special emphasis on dental occlusion. The classification, etiology, diagnosis and treatment of malocclusion are studied on selected orthodontic cases. Simple orthodontic appliances are constructed and inserted.

Public and Community Dental Health

437. Community Dentistry I.—A lecture course designed to introduce the concept of community dentistry. After initial orientation to the general field of public health, the course will stress the specific field of dental public health and related material in preventive dentistry.

Restorative Dentistry

431. Restorative Dentistry and Pedodontics.—Lectures, clinical demonstrations and supervised clinical practice in operative, prosthetic and endodontic treatment. Additional instruction will be given in procedures used in the dental treatment of children.

1966-67

**FACULTY
OF
EDUCATION**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Education calendar, 1966-67

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 A. GUNN, B.Ed., M.A. (Brit. Col.), Instructor.
 MRS. H. I. HARDER, B.A. (West. Ont.), M.A. (Brit. Col.), Instructor.
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 G. A. LEWIS, Instructor.
 R. C. LEWIS, B.Ed. (Brit. Col.), Instructor.
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MISS E. WISEMAN, Instructor.

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MISS FLORENCE BROWN, B.A. (Brit. Col.), Lecturer.

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MISS JOYCE HALLAMORE, M.A. (Brit. Col.), Ph.D. (Munich), Lecturer.

A. P. HARSHENIN, M.A. (Brit. Col.), Lecturer.

ROBERT H. HEYWOOD, M.A. (Brit. Col.), Lecturer.

MISS E. LUND, B.S. (Wash.), M.S. (Cornell), Lecturer.

P. G. OLLEY, B.A. (Brit. Col.), Lecturer.

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MRS. M. RALSTON, B.Ed. (Brit. Col.), Lecturer.

A. J. RENNEY, B.S.A. (Brit. Col.), M.S. (Calif.), Ph.D. (Oregon State), Lecturer.

JAMES SMITH, B.A., B.Ed. (Brit. Col.), Lecturer.

SEYMOUR TOWELL, M.A. (Brit. Col.), Lecturer.

L. WADE, B.A., M.A. (Brit. Col.), Lecturer.

MRS. M. THOMSON, B.A. (Alta.), M.S.W. (Brit. Col.), Instructor, Child Study Centre.

MRS. M. TRYON, M.A. (Toronto), Assistant, Child Study Centre.

MRS. E. NESBITT, B.A. (Brit. Col.), Assistant to the Dean.

J. H. WALLIS, M.A. (Brit. Col.), Academic Assistant to the Dean.

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FACULTY OF EDUCATION

PROGRAMMES

The Faculty of Education offers programmes leading to an undergraduate degree in Education, granted by the University, and to teaching certificates, awarded by the Department of Education of the Province of British Columbia, in the fields of elementary and secondary teacher education. The degree granted is Bachelor of Education (B.Ed. — the hood is white with cord of University blue). Graduate programmes leading to a Master's or Doctor's degree in Education are offered in the Faculty of Graduate Studies.

Undergraduate Certificate and Degree Programmes

A. In the Elementary Teaching Field

(1) A continuous four-year programme from Secondary School Graduation (University Programme), leading to the degree of B.Ed. in the elementary teaching field. Students registering for this (A1) programme must plan to complete the full degree before receiving a teaching certificate (the interim Professional C Certificate).

(2) A four-year programme from Secondary School Graduation (University Programme), leading to the degree of B.Ed. in the elementary teaching field and meeting the course requirements for the interim Professional C Teaching Certificate.

Successful completion of the first two years of this (A2) programme fulfills requirements for the interim Elementary B Teaching Certificate.

A one-year professional programme for students with full First Year in Arts or Science, or its equivalent, or one or more years' credit in another faculty. Successful completion of this professional year fulfills requirements for the interim E.B. Certificate (two years approved credit) or the interim Elementary A Certificate (three years approved credit). With credit for the professional year and courses taken previously in Arts or Science, students may continue toward completion of the Bachelor of Education degree.

(3) A one-year teacher-training programme for graduates of a faculty other than Education who are interested in elementary school teaching. Successful completion of this year fulfills requirements for an interim Professional Basic Certificate.

(4) A two-year programme for teachers holding a Normal School diploma with the Elementary Basic Teaching Certificate and proceeding to the B.Ed. (Elementary) degree.

(5) An Honours programme for the B.Ed. (Elementary) degree.

(6) A fifth year programme for graduates with the B.Ed. (Elementary) degree.

B. In the Secondary Teaching Field

(1) A five-year programme from Secondary School Graduation (University Programme), leading to the degree of B.Ed. in the secondary teaching field and meeting the course requirements for the interim P.B. Teaching Certificate.

(2) Programmes enabling elementary teachers with the first two years of credit toward the degree of B.Ed. in the elementary field to complete, by winter or summer sessions, the remaining three years of training leading to the interim P.B. Teaching Certificate and the degree of B.Ed. in the secondary field.

(3) A one-year teacher-training programme enabling graduates, with an acceptable bachelor's degree from a faculty other than Education, to meet the requirements for the interim P.B. Teaching Certificate.

Diploma Programme in Adult Education

The Faculty of Education and the Department of University Extension jointly offer a Diploma in Adult Education. This programme is designed for persons who wish to acquire the skills and knowledge required to organize, conduct, evaluate and generally administer programmes in adult education but who, for a variety of reasons, do not wish to pursue a graduate degree.

TEACHING CERTIFICATES

Since sole authority to issue teaching certificates rests with the Provincial Department of Education, Victoria, B.C., a degree or diploma from the University is not a licence to teach. The standing of candidates who successfully complete any of the above programmes will be reported by the University to the Department of Education. (See sections on Transcript of Academic Record and application for British Columbia Teacher's Certificate.)

ADMISSION REQUIREMENTS

Applicants for admission to the Faculty must meet the general requirements of the University. The Faculty reserves the right, however, to reject applicants for admission on the grounds of physical or health disabilities, or for other reasons, including unsatisfactory academic record. Applicants who fail to meet the minimum required standards in the Speech Clearance Test or the Written English Test will be automatically rejected.

Special additional requirements for admission to the one-year postgraduate course are listed below:

For the One-Year Programme for Graduates in the Elementary Division, A(3) above:

Candidates will be admitted who hold a degree from a recognized university in which they have obtained an average of 65% or higher in the last two years, or in which they have obtained a 65% or higher average in one acceptable major.

For the One-Year Programme for Graduates in the Secondary Division, B(3) above:

(a) Candidates will be admitted who:

Hold a degree from a recognized university with completed majors (9 units of work in each of the Third and Fourth Years), or the equivalent thereof, in two of the following subjects: Art (with adequate studio courses), Biological Sciences (Biology, Botany, Zoology, including at least one approved course in each of Botany and Zoology), Chemistry, English, French, Geography, German*, History or International Studies, Latin*, Library, Mathematics, Music, with adequate courses, Physics, Russian*, Spanish*, Theatre*, and have obtained on average of 65% in those courses of the two senior years which go to make up each of these majors.

or

Have completed an Honours or a Master's degree, or a degree with an expanded major of at least 24 units and of appropriate content, in a subject widely taught in B.C. schools. (See Note II below.)

If two majors are offered, one must be in a subject widely taught in British Columbia Secondary Schools.

Note: Subjects marked with an asterisk are not widely taught in this province.

(b) Candidates with averages in the range 60% - 65% but who do not meet the above requirements, as well as those holding other degrees such as B.A.Sc., B.Com., B.H.E., B.Mus., B.P.E., B.S.A., B.Sc. (general course), B.S.F., B.S.P., LL.B., and who wish to be considered for admission, should apply in writing to the Registrar requesting that their cases be reviewed by the Committee on Admissions, Standing and Courses. Applications of this type must be received by the Registrar prior to September 1.

Note I: Students planning to enter teaching would be well advised to consult the section on "Teaching Majors for Secondary Teachers."

Note II: Faculty of Arts subjects widely taught in B.C. schools will include: English, French, Geography (with some History), History (with some Geography). If an expanded major only in one of these areas is offered for admission to the One-Year Programme for Graduates, it would have to include 18 units of course work in the major at the 300 or 400 level. If the 15 unit major is offered, 9 units at the 300 or 400 level in another school subject would have to be included in the degree.

If Faculty of Arts students prepare an Honours or major in some other teaching subject (such as German, Latin, Spanish, Russian), they would also be required to offer at least 9 units of course work at the 300 or 400 level in a subject widely taught in B.C. schools.

Admission with Advanced Standing

(a) Students with Full First Year Arts or Science or their equivalent will be admitted to the Second Year of either programme leading to a degree in Education.

(b) Students from other universities and from other countries are referred to the General Information bulletin.

(c) Students who are completing work for a degree in another faculty may transfer to the Faculty of Education. Credit will be given for those courses, already completed, which meet the requirements of the major or of the programme selected.

(d) Students transferring from the degree programme in the elementary field to the degree programme in the secondary field, or from one major to another within a programme, will be given credit for those courses already completed which meet the requirements of the newly selected programme. No application for transfer will be approved when the student has failed the previous year's work. No credit will be granted to Elementary transfers for the professional courses of the second year of the Elementary programme unless all the professional work of the first two years has been successfully completed at the time of transfer.

(e) A student who has completed courses at another university may submit to the Registrar a transcript of his record to be evaluated toward the requirements for a degree in Education at the University of British Columbia. Once registered in the Faculty, however, the candidate may expect credit for courses subsequently taken elsewhere only when prior permission has been obtained from the Director of Elementary or Secondary Education. In normal circumstances candidates who transfer from other institutions must complete at least the final two years of the degree course at the University of British Columbia.

(f) The Faculty of Education has no programme leading to a B.Ed. degree for those who already hold a degree from another Faculty. The proper programme for those with a first degree is that leading to a Master's degree.

Inquiries Regarding Admission

Students who plan to enroll in the Faculty for the first time should write to the Registrar, The University of British Columbia, Vancouver 8, B.C., before August 1. Needless delay will be avoided if the following information is provided:

- (a) name in full;
- (b) two copies of official transcripts of high school and university records;
- (c) a "transfer of credits" statement from the Registrar, Department of Education, Victoria, B.C., if applicant holds a B.C. Teacher's Certificate;
- (d) statement as to the particular course or programme in Education desired, and, where this involves the secondary programme or the upper years of the elementary programme for the B.Ed. degree, a statement of the subject or subjects preferred for majors or for honours.

Fees—*Subject to change without notice*

First Term Fees: \$243 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$457 at time of registration. Students in their final year are assessed an additional \$7 to cover the Graduating Class fee.

Second Term Fees, \$214, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation in the spring must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Students who complete course requirements for a degree at a Summer Session will be given a statement to this effect. These students must apply for graduation as part of their registration in the Summer Session.

The Congregation ceremony for the conferring of degrees will be held once only during each year, in early June.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments, may, on the recommendation of a Director, be excluded by the Dean of the Faculty from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's Office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide

by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Re-Admission

(a) A student who passes in fewer than 6 units (2 courses) in the first year of University following Grade 12 will not be permitted to re-enrol at the University to repeat the studies of that year. Consideration will be given to re-admitting a student in this category following his satisfactory completion of Grade 13 or its equivalent. A student who passes 6 units, while not receiving credit in the year, may re-enrol on probation to repeat his studies but during the subsequent session may be required to withdraw at any time for unsatisfactory progress.

(b) A student in the first year who obtains credit for only 9 units on a full programme will be re-admitted on probation but during the subsequent session may be required to withdraw for unsatisfactory progress.

(c) A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to withdraw from the University; he may be re-admitted after a period of at least one year if his appeal for permission to re-enrol is supported by the Committee on Admissions and upheld by Senate.

Examinations and Advancement

Examinations

1. Examinations for the winter session are held in April and at such other times as the instructors may decide. These examinations are obligatory for all students.

2. Applications for special consideration on account of illness (supported by medical certificates) or domestic affliction must be submitted in writing to the Dean as soon as possible after the close of the examination period.

3. In any course which involves both laboratory work and written examinations, students will be required to make satisfactory standing in both parts.

Standing and Credit

1. Candidates taking at least 15 units of work, and obtaining at least 50% in each subject, will be graded as follows: First Class, an average of 80% or over; Second Class 65 to 79%; Passed, 50 to 64%.

2. (a) A student taking 9 or more units in the winter session will not receive credit for any course unless he successfully completes 9 units.

(b) A student taking fewer than 9 units in the winter session will receive credit for a course only if, as a result of the final examinations of that session, he passes in all his courses.

(c) No student employed full time as a teacher may receive credit in the Faculty of Education for more than one course completed in any given Winter Session.

3. Courses for which credit has not been obtained must be repeated, or permissible substitutes taken, in the next regular session attended. In the winter session the total of all courses taken may not exceed 18 units.

4. Essays and examinations will be refused a passing mark if they are deficient in English.

5. To be eligible for the Bachelor of Education degree the candidate must normally have earned:

- (a) A mark of at least 50% in each of the courses comprising the degree programme;
- (b) An average of not less than 60% in the senior courses of each of the majors which constitute the candidate's programme.

6. A student who meets the minimum requirements for passing in a given year but whose standing is nevertheless considered by the Faculty to be unsatisfactory will be placed on probation for the following year. At the end of his probationary year he may be re-instated or, if there has been insufficient improvement, he will not be permitted to proceed to the next highest year. Generally speaking, probation will follow (a) in the 1st and 2nd years—failure to earn an average of 55% in the 15 units of work. (b) in the 3rd and 4th years—failure to earn an average of 60% in the work taken in each of his major subjects.

Regulations concerning probationary standing also apply to students of the Faculty undertaking course work in the Summer Session, Extra-sessional classes or by correspondence.

7. Except in special cases, no student may repeat a course more than once.
8. (a) Any student who completely fails all courses during a session (or all but one) may be required to withdraw from the Faculty.
(b) A student failing two years will be required to withdraw permanently from the Faculty.

Supplementals

1. In the winter session a student will be granted the privilege of writing supplementals in not more than three units of courses taken during that session provided that

- (a) he has obtained during that session at least 12 units of credit;
- (b) he has written the final examination in the subject concerned and has obtained a final grade of at least 40%.

2. In the summer session, a candidate will be granted a supplemental in a subject which he has taken during that session provided (i) he has written the final examination and has obtained a final mark of not less than 40% and (ii) he has obtained 3 units of credit in that session.

3. In an extra-sessional or correspondence course, a student will be granted a supplemental in a subject in which he has obtained a final mark of not less than 40%.

4. The Faculty may, at its discretion, grant supplemental privileges in a further 3 units to a student whose course work during a full winter session is in excess of 15 units.

5. At the discretion of the Faculty, arrangements may be made in certain cases for a further trial period of practice teaching.

6. In all but the Final Year a candidate who has been granted a supplemental may write it once only. If he fails, he must repeat the course or take a permissible substitute. In the Final Year he may write it twice (subject to the limitation in section 3 under "Standing and Credit").

7. Supplemental examinations, covering the work of both the first and second terms, will be held during August in respect of winter session examinations. Supplemental examinations for summer session students will be held in December at the University. Supplemental examination privileges will not be granted to students who fail the laboratory work of science or Industrial Education courses.

8. If a student, because of exceptional circumstances, is permitted to postpone a supplemental beyond the first regular supplemental examination period, he will be responsible for the content of the course as currently offered. If the course is discontinued, the supplemental privilege may be cancelled. Attention is also drawn to section 3 under "Standing and Credit".

Practice Teaching, Laboratory and Seminar Requirements

All students in Education who are engaged in observation and practice teaching, will be assigned to a regularly held seminar under the direction of a faculty adviser.

Student participation in school activities, whether it be observation, teaching practice, demonstration lessons, or field trips, will become the basis for discussion in these seminar groups. Laboratory note books are required.

The granting of a degree or teaching certificate is dependent upon satisfactory performance in these laboratory courses. No units are awarded.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the dead-line.

Re-Reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Application for British Columbia Teacher's Certificate

The teacher, the University and the Department of Education are all concerned in the process of the raising of the teacher's certificate. The teacher plays his part by choosing a degree programme, by selecting courses from the University calendar to meet regulations of this programme and by applying at the appropriate times during his university work for a change of certificate.

For the Winter Session the University sends to the Department of Education in June a statement of the standing of all students registered in the Faculty of Education who might qualify for a teacher's certificate. At the same time that students are mailed their individual marks they are given application forms to be completed and mailed to the Department of Education carrying the request for the issuance of a particular certificate. If the University's statement and the teacher's request agree, the Department issues the certificate. If the statements disagree the Department asks the University for a reassessment of standing. Students of any faculty other than Education during the Winter Session, or students who complete an Extra Sessional or Correspondence Course, must not only request the Department for a change of certificate but also ask the Records Office of the Faculty to send a statement of standing to the Department.

In the Summer Session these two steps are combined. An applicant completes a card in his registration envelope which is a request for a change of certificate; at the end of the Summer Session the student's standing is noted on this card and the card is forwarded to the Department. In any case where the student's evaluation of his position differs from the University evaluation the student is so informed. It is hoped that teachers' claims can be checked during the Summer Session so that apparent conflicts can be resolved.

If the above procedures are followed the student will seldom find it necessary to have a transcript of record sent to the Department of Education of this province.

ELEMENTARY DIVISION

A (1)—The Bachelor of Education (Elementary) Degree Programme

This is a preferred programme, at present experimental. It is designed to offer to the student, who can remain in university until the completion of the degree, certain advantages over the other programmes:

1. The professional courses and practice teaching are distributed over a longer period of time.
2. The student has the opportunity to major in *both* an academic and a professional field.
3. In lieu of these two majors a student may take a *double major* in art education or music education or science education.
4. The mid-term and weekly practice-teaching sessions have been discarded in favour of periods of practice-teaching following the examinations in the spring. In this way the student may devote his full attention to his course work during the term and to his teaching during the post-sessional practicum.

Students will be admitted to this programme on the understanding that certification will not be granted until successful completion of the full degree programme when they will be eligible for the Interim Professional C Certificate.

Students will normally enter this programme in first year but may be admitted as transfer students after senior matriculation or first year arts or science.

First Year*	Units
English 100	3
**History 100 or Geography 100	3
A first year laboratory science: such as Biology 101, Chemistry 101 or 102 or 110, Geography 101, Physics 103 or 110 or 120, Geology 105	3
Two of: F.A. 101 or Music 120, Music 101, first year of a language other than English, Mathematics 100 or 120, P.E. Activity Courses, Psychology 100	6
Education 197—(Counselling, orientation, and observation)	0
	—
	15
Second Year*	Units
English 200	3
Prerequisite for Academic major (or elective if no prerequisite needed)	3
***History 100 or Geography 100	3
Education 203 or 204—Curriculum and Instruction in the Language Arts	3
Mathematics 203	3
Education 297—(Seminars, demonstrations and post-sessional practicum)	0
	—
	15

*Note: Students who have been permitted to take more than 15 units in each of the first two years will not be permitted credit for such extra units beyond the year when taken.

Third Year	Units
English 303—Composition	3
Courses of the Academic and/or Professional Major (single or double)	6
Education 201, 202—Curriculum and Instruction in Science and Social Studies	3
Education 310 (Growth and Development), and Education 311 (Nature and Measurement of Learning) or a course of the Professional Major	3
Education 205, 207, 209—Curriculum and Instruction in Art, Music, and Physical Education	3
Education 397—(Seminars and post-sessional practicum)	0
	18

Fourth Year	Units
Education 310/311 or a course of the Professional major (whichever alternative not taken in Third Year)	3
Courses of the Academic and/or Professional Major (single or double)	12
Education 400 (Survey of Educational Thought) or Education 430 (History of Education) or Education 470 (Educational Sociology)	3
Education 497 (Seminars and post-sessional practicum)	0
	18

**To meet degree requirements, a student must take both Geography 100 and History 100 (or some other history course).

***In the case of double majors, a course of the major would be substituted for these 3 units and History 100 or Geography 100 taken later in place of third year course of the major.

A (2)—The Bachelor of Education (Elementary) Degree Programme

This programme consists of a total of 66 units. Students transferring from another faculty or after Grade 13 will require a total of 69 units.

Successful completion of the first two years of this programme fulfils requirements for the interim E.B. Teaching Certificate; successful completion of three years, the interim E.A. Certificate; graduation with the B.Ed. degree, the interim P.C. Certificate.

First Year*	Units
English 100	3
History 100 or Geography 100	3
A first year laboratory science such as Biology 101, Chemistry 101 or 102 or 110, Geography 101, Geology 105, Physics 103 or 110 or 120	3
Fine Arts 101, or Music 101, or the first year of a foreign language, or Mathematics 110 or 120, or P.E. activity courses...	3
Education 102	3
Education 197	0

Second Year *	Units
Education 297	0
Education 201	1½
Education 202	1½
Education 203 or 204	3
Education 205	1
Education 207	1
Education 209	1
English 200	3
Mathematics 203	3

*Note: Students who have been permitted to take more than 15 units in each of the first two years will not be permitted credit for such extra units beyond the year when taken.

Third Year	Units
English 303 or 304	3
Education 331 or other approved course in educational psychology	3
History 100 (alternatively History 206) or Geography 100	3
9 units devoted to the major chosen, or to electives or to a combination of both†	9

Fourth Year	Units
Education 400 or 430	3
Elective (Academic or Professional)	3
12 units devoted to the major chosen, or to electives or to a combination of both†	12

The programme above is planned so that students may leave the University after the Second Year to teach in schools. The Department of Education may grant an interim teaching certificate to those who complete the first two years successfully; but the certificate will not be permanent until the full Third Year is completed; and the University will, of course, not award a degree until all four years are successfully accomplished. The plan, however, allows teachers to complete the Third and Fourth years by summer session attendance or by extra-session courses during the winter.

The work of the first two years requires full-time attendance during the day for the normal University winter session.

Students from other faculties may transfer to the programmes outlined above, and adequate provision is made for substitution of courses for those prescribed above. At least one full winter session must be taken in the Faculty. All the prescribed professional courses must eventually be completed before the degree will be awarded.

†In this block of 21 units in Third and Fourth years the student is expected to complete at least one major. If he chooses a professional major the remaining courses of the 21-unit group should be academic. If he chooses an academic major, the remaining courses should be professional. (See page L26 for sections regarding academic and professional majors.)

Students transferring to the Faculty of Education after senior matriculation or first, second, or third year in another faculty.

Such students will register as second, third, or fourth year "transfer students" respectively. They may be enrolled in either the A1 Programme if entering second year education or in the A2 Programme if entering second, third, or fourth year Education. Students transferring after three years in another faculty must make special application to the Director for admission.

Transfer students registering in the A2 Programme will take as the first year in Education the following courses:

	Units
Education 297	0
Education 102	3
Education 201	1½
Education 202	1½
Education 203 or 204	3
Education 205	1
Education 207	1
Education 209	1
English 200 or 303 or 304	3
Mathematics 203	3

Students, after this year, may then carry on toward the completion of the requirements for the Bachelor of Education degree. Transfer students on the A2 Programme require 69 units for the Bachelor of Education degree.

A (3)—Programme in Elementary Education for graduates of other faculties.

Students with a Bachelor's degree from another faculty who desire to become elementary teachers will take the following programme:

	Units
Education 301—Educational Psychology	3
One of Education 400—Survey of Educational Thought or Education 430—History of Education or Education 470—Educational Sociology	} 3
Education 205, 207, 209—Curriculum and Instruction in Art, Music and Physical Education	3
Mathematics 203—Mathematics for Teachers	3
Education 497—Practice Teaching	0
For the remaining 6 units students may choose one of the following groups A, B, or C	6
	18

(A) *Recommended for students who have taken considerable undergraduate work in mathematics and the sciences:*

- Education 409 (Graduate Section)—Science Education
- Education 406—Curriculum and Instruction in English and Social Studies

(B) *Recommended for students who prefer teaching the Primary Grades (Kindergarten to Grade 3):*

Education 203—Curriculum and Instruction in the Language Arts and Integrated Subjects of the Primary Grades

Education 202—Curriculum and Instruction in Geography and History

Education 201—Curriculum and Instruction in Elementary Science

(C) *Recommended for students who prefer teaching the Intermediate Grades:*

Education 204—Curriculum and Instruction in the Language Arts

Education 202—Curriculum and Instruction in Geography and History

Education 201—Curriculum and Instruction in Elementary Science

Although the requirements for the Interim P.B. Certificate are satisfied by this programme, a further 6 units taken subsequently to the One-Year Programme for Graduates are needed to satisfy the requirements for the permanent P.B. Certificate. These 6 units must be in Education unless otherwise specified by the Committee on Admissions, Standing and Courses.

A (4)—Programme for Teachers Holding a Normal School Diploma and Senior Matriculation (or its Equivalent)

Students who are graduates of a recognized Canadian, British or other Normal School or Teachers College who also possess senior matriculation or equivalent standing will be granted credit as transfer students toward the B.Ed. degree as follows:

	<i>Units</i>
Senior matriculation or equivalent	15
Professional teacher training	15

Before being granted full second year standing on the B.Ed. degree programme they will have to complete English 200 unless an equivalent second year English course has previously been taken.

Students with the above requirements will then be registered in Third Year of the B.Ed. A2 Programme. On completion of the work of Third and Fourth Years on this programme the B.Ed. degree will be granted.

A (5)—Honours Programme for the B.Ed. (Elementary) Degree:

A student may proceed to the B.Ed. degree (Elementary field) in a Single Honours course in certain academic fields. The following regulations govern these courses:

1. The student must have at least a second class average in his second year and a second class in the prerequisite or prerequisites of the subject in which he is contemplating taking Honours.

2. He must have the consent of the Director of the Elementary Division and of the Department which offers the Honours courses.

3. He must maintain a second class average or better in each of his Third or Fourth Years.

4. At least 18 units in Third and Fourth Years must be taken in the Honours subject. The student should consult the Department concerned to discover which courses are required by that Department. The Department may require the candidate to present a graduating essay which may count from 3 to 6 units.

5. The degree may require an additional 6 units of credit in Third and Fourth Years which may be completed by Summer Session. Aside from this the Honours Programme requires attendance in regular session for third and fourth years.

A (6)—Fifth Year Programme for Graduates with the Bachelor of Education (Elementary) Degree:

Graduates of the four-year programme in the Elementary Field may fulfil requirements for P.B. certification by completing an appropriate fifth year of study under the guidance of the Director of the Elementary Division.

Those wishing to continue the Fifth Year of study with Elementary teaching or administration in mind will be required to take a 15 unit Fifth Year. To be recommended for P.B. certification a 60% average in these courses is required. For entry to a Master's Programme a 65% average is required.

A student who has not taken in his Bachelor of Education Programme a minimum of 9 units of senior academic courses in addition to the compulsory Third Year English course must take this 9 unit minimum in his Fifth Year. Otherwise his Fifth Year courses may be a sequence of senior academic and/or professional courses chosen in consultation with the Director of the Elementary Division.

For those seeking entry through this Fifth Year to the Faculty of Graduate Studies, a 65% average is required in the courses of the Fifth Year. A student must also have attained 2nd class or higher standing in the Bachelor of Education degree and must show either in his undergraduate or Fifth Year programme two first class marks (6 units) in senior Professional courses. It is also possible for graduates with the Bachelor of Education (Elementary) degree to fulfil requirements for the P.B. Certificate in the Secondary teaching field. (Consult the Director of the Secondary Division.)

Professional and Academic Majors for Elementary Teachers

In the A1 Programme students are required to complete *both* an academic and a professional major.

In the A2 Programme students have 21 units in Third and Fourth year in which they are expected to complete *either* an academic major or a professional major. Those of the 21 units in excess of the requirements of the major may be devoted to electives. If an academic major is chosen the electives are to be professional courses, if a professional major, the electives are to be academic courses.

Successful completion of the Bachelor of Education degree requires an average of 60% in the senior courses constituting the major.

Academic Majors

These are majors composed of courses offered in the fields of arts, science, or commerce. For course offerings students should consult the calendars of these faculties. For the requirements of an academic major on the B.Ed. (Elementary) degree programme a student must have a minimum of 9 units of Third or Fourth Year courses in the field plus any first and second year prerequisites. Any departure from these requirements must be authorized by the Director of the Elementary Division.

A student may choose to complete an academic major in the Third and Fourth Years. By consultation with the department concerned, the student

will find this is possible in certain fields such as Classics, English, French, Geography, History and Mathematics. If First and Second Year prerequisites prevent completion of an academic major, the student may choose a professional major and elect a group of academic courses for the remainder of the 21 units. For academic major requirements consult the Arts or Science calendars. Any departure from these requirements must be authorized by the Director of the Elementary Division.

Art Education

1st year

F.A. 101.

3rd year

F.A. 300 and any ONE of the following: F.A. 303, F.A. 305, F.A. 307, F.A. 401.

4th year

Ed. 305, F.A. 302 and any ONE of the following: F.A. 402, F.A. 403, F.A. 405, F.A. 407.

Intermediate Education

Education 415, English 311, General Science 309.

One elective from: Ed. 305, 306, 307, 308, 365, 407, 408, 414, 416, 419, 460, 462, Theatre 301, Math. 303.

Librarianship

English 311, Education 390, 491, 492.

Music Education

1st year

Music 101.

3rd and 4th years

Music 201, Music 120 or F.A. 101 in place of Ed. 331, Music 302, Music 303, Ed. 307, Music 401 or two of Music 140, 141, 142 (2 units each).

Physical Education

Activity Courses—9 units. (Consult the School of Physical Education calendar concerning these course requirements).

Theory Courses—6 units as follows: P.E. 262, 260 or 360; 3 units chosen from 361, 460, 462, 470.

Pre-School

Education 333, 334, 336; one elective from Education 305, 306, 307, 309, 405, 407, 417, 428, 470, English 311, Soc. 306, Psych. 206 or 400, Anthro. 200, Gen. Sci. 309.

Primary Education

Education 405, General Science 309, English 311; one elective from Education 305, 306, 307, 308, 414, 415, 419, Theatre 301.

Special Education

Education 407; 3 courses of Education 408, 415, 417, 418, 419, 420, 422, 423, 424, 462.

Students wishing to take a professional major in Special Education with emphasis on speech handicapped children will take the following course

sequence: Education 407, 419, 422 and *one* elective from Education 423, 424, Theatre 301.

Science Education

3 of Biology 101, Geology 105, Chemistry 101 or 102 or 110, Physics 103 or 110, or 120; Zoology 416 or other approved course; General Science 309, Education 409.

Double Majors in Art, Music, or Science

(Open to students on Programme A (1) only)

Art Education

First Year—F.A. 101.

Second Year—F.A. 300, 301.

Third Year—F.A. 302 and one of F.A. 303, 305, 307, 401.

Fourth Year—Education 305 and one of F.A. 402, 403, 405, 407.

Fine Arts electives (6 units).

Music Education

First Year—Music 101 (recommended) or F.A. 101 or Music 120.

Second Year—Music 201 or Music 101, F.A. 101 or Music 120.

Third Year—Music 201 if not taken previously, otherwise Music elective. Music 302, Music 303.

Fourth Year—Music 401, Education 307. Two of Music 140, 141 and 142 (2 units each).

Science Education

First and Second Years—At least three of Biology 101; Chemistry 101 or 102 or 110; Geology 105; Physics 103 or 110 or 120.

Third and Fourth Years—General Science 309; Zoology 416 or other approved science course; Education 409; six units of approved science elective courses.

SECONDARY DIVISION

The Bachelor of Education (Secondary) Degree Programme

This is the standard programme designed for the training of secondary teachers. It consists of a minimum of 78 units. Students transferring from the Elementary Division complete at least 81 units. Every student is required either to major in two subjects ordinarily taught in high school or to take an Honours Course in one such subject. In each major, in addition to prerequisite courses, at least 15 units must be taken, 9 of which must be from senior years. An average of 60% at least is required in the senior courses of each of the majors which constitute a candidate's programme. A candidate who elects to take an Honours Course in one teaching field must be prepared to complete 84 units for the degree. In the regular 78 (or 84) unit programme, a maximum of 24 units of Education is permitted. The professional courses listed for the fifth year may not be taken in the earlier years.

Acceleration

The standard Secondary Programme ordinarily requires attendance at *five winter sessions*. Permission to accelerate may be granted by the Director *at the end of the Second Year* if the student has achieved at least **Second Class** standing in the work of the first two years, and if he can complete the required amount of practice-teaching. Students are warned that no credit will be given for courses taken for the purpose of acceleration unless prior permission is obtained from the director.

First Year	Units
English 100	3
One of History 100, Geography 100, History 202 (recommended for students from outside of Canada), History 206	3
Two of Mathematics 110 or 120, first year science course, first year language other than English	6
Elective or necessary prerequisite in major subject	3

Second Year	Units
Education 200	3
English 200	3
9 or 12 units in Arts, Science, Agriculture, Commerce, Home Economics, Industrial Education, or Physical Education to complete any omitted courses of the First Year and to complete prerequisites or to commence work in teaching majors	9 or 12
Education 298	0

Note: Students who have been permitted to take more than 15 units in each of the first two years will not be given credit for such extra units beyond the year when taken.

Third Year	Units
Education 332	3
Courses required for majors or Honours	12 or 15

Fourth Year	Units
English 303 or 304	3
Education 301	3
Majors, combined majors, or Honours	9 or 12
Education 498	0

Fifth Year	Units
One of Education 400, 430, 470	3
Education 404 relating to the teaching majors	3
(Every student is strongly urged to audit an additional course in Education 404)	
Education 435, Education 410	3
Two of Education 400, 401, 407, 408, 411, 412, 414, 415, 416, 417, 430, 460, 461, 470, 490; or one of the above Education courses and one academic elective approved by the Director. (See note below.)	6
Education 499	0

NOTE: The student planning to proceed to a Master's degree in Education following completion of his undergraduate degree work is advised to elect one of the following from the above list according to his intended field of specialization:

- Education 400 (for Philosophy of Education)
- Education 401 (for Educational Psychology)
- Education 407 (for Special Education)
- Education 411 (for Guidance and Counselling)
- Education 412 (for Adult Education)
- Education 430 (for History of Education)
- Education 460 (for Administration)
- Education 461 (for Curriculum and Instruction)
- Education 470 (for Educational Sociology)

Other Programmes — Secondary Field

I. One-Year Programme (Secondary) for Graduates:

Although the requirements for the Interim P.B. Certificate are satisfied by this programme, a further 6 units taken subsequently to the One-Year Programme for Graduates are needed to satisfy the requirements for the permanent P.B. Certificate. These 6 units must be in Education unless otherwise specified by the Committee on Admissions, Standing and Courses.

	Units
Education 301	3
One of Education 400, 430, 470	3
Education 404	3
Education 410	1½
Education 428	1½
One of Education 400, 401, 407, 408, 411, 412, 414, 415, 416, 417, 430, 432, 460, 461, 470, 490	3
Education 499	0

2. Three-Year Programme for Teachers Holding the Elementary Basic Teaching Certificate:

Candidates must have completed as part of the first two years: English 200; two of Mathematics 110 or 120, a first year Science, a first year language other than English; and one of History 100, Geography 100, History 202, History 206.

No student who has not completed successfully the first two years of the Elementary programme will be allowed to transfer from the Elementary programme to the third year of the Secondary programme.

Third Year (see Note 1 below)	Units
Courses required for majors or honours or prerequisites thereto	18
 Fourth and Fifth Years (see note 1 below)	 Units
English 303 or 304 (see Note 2 below)	3
Courses required for majors in two teaching subjects	21
One of Education 400, 430, 432, 470	3
Education 404 (corresponding to each of the teaching majors) (see notes 3 and 4 below)	3-6
TOTAL	48-51

3. Fifth Year for Students Holding a B.Ed. (Elementary) Degree:

Graduates of the four-year degree programme in the Elementary field who wish to prepare themselves for teaching in the Secondary schools may fulfil requirements for the P.B. certificate by completing an appropriate fifth year of study under the guidance of the Director of the Secondary Division. By the end of this fifth year the student must have completed two teaching majors of the Secondary Division with an average of at least 60% in each.

NOTES:

1. Where the student's programme permits electives, these should ordinarily be chosen from the academic subjects. Only three units of Education courses other than those which are required may be counted for degree credit. Courses relating to teaching in the elementary school including Mathematics 203 and 303 will not be accepted for credit. Any one of the following courses will carry credit: Education 400, 401, 407, 408, 411, 412, 414, 415, 416, 417, 430, 432, 460, 470, 490.
2. All English majors must complete English 304 instead of English 303.
3. Where appropriate to the student's teaching major, Education 305, 307 or 490 may be substituted for the Education 404 course in the corresponding subject matter field.
4. A student in attendance at a Winter Session will be required to take Education 498 (Professional Section). All holders of Professional Teaching Certificates will be given the opportunity of meeting together in a special seminar and of participating in individually arranged field work in the Senior Secondary Schools of the Vancouver area.

Teaching Majors for Secondary Teachers

Candidates must major in two, or complete a double Major or an Honours equivalent in one, of the following subject areas. *The Honours course, the double Major, or one at least of the teaching majors, should be in a subject widely taught in British Columbia Schools.* An average of 60% at least is

required in the senior courses of each of the majors which constitute a candidate's programme. Arrangements for an Honours Course in a teaching subject are indicated on page L38. Courses carrying fewer than 3 units of credit are indicated by a smaller number in brackets following the course number, e.g. Horticulture 200 (1½). Only with the prior permission of the Director of Secondary Education may exceptions be granted in any of the following course requirements for majors.

Note: Students who wish to prepare a double major in Chemistry, Physics, Biology, Botany or Zoology must consult the Director at the end of the first and second years.

1. Agriculture

First and Second Years: Mathematics 110 or 120, Chemistry 101 or 102 or 110, Physics 103 or 110, or 120, Biology 101, Agriculture 100 (1) and 3 units chosen from Animal Science 200 (1½), Horticulture 200 (1½), Soil Science 200 (1½), Agriculture Mechanics 200 (1½), Dairying 200 (1½), Poultry Science 200 (1½), Agricultural Economics 200 (1½), Agronomy 200 (1½). Geology 105 is recommended. It may be deferred until Third or Fourth year.

Senior Years: Agriculture 300 (1), 9 units in the 200-level courses named above and not chosen previously, and 3 units of approved senior Agriculture courses.

Note: The requirements of Agriculture 300 are completed by participation in the one-week field trip just prior to the registration week of the Fourth or Fifth Year.

2. Art (Single Major)

First and Second Years: Fine Arts 101, 300.

Senior Years: Fine Arts 301, 302 and one of the following groups of two: Fine Arts 401, 402; Fine Arts 303, 403; Fine Arts 305, 405; Fine Arts 307, 407.

3. Art (Double Major)

First and Second Years: Fine Arts 101, 300, 301, 302.

Senior Years: Fine Arts 401, 402, 404, 425, and one of the following groups of three: Fine Arts 303, 403, 413; Fine Arts 305, 405, 415; Fine Arts 307, 407, 417.

4. Biological Sciences (Single Major)

First and Second Years: Biology 101, Chemistry 101 or 102 or 110, Mathematics 120 or 110, Physics 103 or 110 or 120, Biology 234 (1½) and one of Biology 240 (1½), 321 (1½), 322 (1½), Geology 105 (may be deferred to the Third or Fourth Year). Microbiology 200 or Chemistry 230 is recommended.

Senior Years: At least nine units of approved work in Biology, Botany or Zoology to include a course in Physiology (Botany 330 or Zoology 303 or 304 or Biology 330), a course in ecology if not previously taken, at least one of Botany 302, 303, 304, 305, at least one of Zoology 202, 301, 416 or other approved course.

5. Biology (Double Major)

First and Second Years: Biology 101, Chemistry 101 or 102, or 110, Mathematics 120 or 110, Physics 103 or 110 or 120, Biology 234 (1½), one of Biology 240 (1½), 321 (1½), or 322 (1½), Geology 105 (which may be deferred to the third or fourth year), Chemistry 230 (which may be deferred).

Senior Years: 18 units of Biological Science to include Microbiology 200, a physiology course (Botany 330 or Zoology 303 or 304 or Biology 330), at

least one of Zoology 202 or 301 or 416, at least one of Botany 302, 303, 304, 305, and some ecology if not previously taken. The programme should be approved by a member of the Science Department of the Faculty of Education. Additional recommended course: Mathematics 202 or 205 or Plant Science 321 and 322.

Note: Only one of English 200 or 303 need be taken.

6. Botany (Double Major)

First and Second Years: Biology 101, Chemistry 101 or 102, or 110, Mathematics 120 or 110, Physics 103 or 110 or 120, one of Botany 302, 303, 304 305; Geology 105 (which may be deferred to third or fourth year).

Senior Years: Chemistry 230, 18 units of biological science including Biology 234 (1½), Botany 330, at least 6 additional units in Botany including some ecology, at least 3 units in Zoology, and at least 3 additional units in Botany, Biology, Microbiology or Zoology.

Additional recommended course: Mathematics 202 or 205 or Plant Science 321 and 322.

Note: Only one of English 200 or 303 need be taken.

7. Commerce (Business Major)

First and Second Years: Mathematics 110 or 120, Commerce 151, Economics 200, Computer Science 200, 201.

Senior Years: Commerce 331, 376, three units chosen from: Commerce 307, 322, 324, 337, 356, 383; Computer Science 300.

8. Commerce (Secretarial Major)

First and Second Years: Commerce 151, and two of: Economics 200, Geography 201, Computer Science 200 and 201.

Senior Years: *Education 375, Commerce 376, and three units of electives as for the Business Major, with Commerce 331 added to the list.

9. Commerce (Double Major)

First and Second Years: Mathematics 110 or 120; Commerce 151, 252; Economics 200; Geography 201; Computer Science 200, 201.

Senior Years: Commerce 376 and 331; *Education 375; six units from: Commerce 307, 322, 324, 337, 356, 383, Computer Science 300.

*Skills in shorthand and typewriting are prerequisite to Education 375. Instruction is provided on the campus without credit. Students should arrange for instruction beginning in the first year.

Note: All students are required to demonstrate competence in typewriting before being awarded a certificate. Instruction will be provided on campus without credit.

10. Chemistry (Single Major)

First and Second Years: Chemistry 101 or 102 or 110, and 200 or 205, Mathematics 120 or 202, Physics 103 or 110 or 120, Biology 101, Geology 105 (may be deferred until third or fourth year).

Senior Years: Chemistry 230, 310 and three additional units chosen from Third or Fourth Year Chemistry. Chemistry 304 is recommended.

11. Chemistry (Double Major)

First Year: Chemistry 101 or 102, or 110, English 100, Mathematics 120, Physics 120 or 110 (or 103), and either Biology 101 or one of History 100, 202, 206, Geography 100. If Biology is elected, the History or Geography may be deferred to the second year.

Second, Third and Fourth Years: Biology 101 if not taken in first year, Mathematics 202 (or 220), Geology 105, Chemistry 200 or 205, 203 or 230, 304 or 305, 310 and 9 additional units in Chemistry.

Additional recommended courses: Mathematics 300 and Physics 200 (or 204).

Note: Only one of English 200 or 303 need be taken.

12. Creative Writing

First and Second Years: English 100, 200, and Creative Writing 201 or 202.

Senior Years: English 304; two of Creative Writing 407, 409 and 410; the third course of the foregoing sequence or a senior academic elective approved by the Department of Creative Writing.

Note: One of French, Spanish, Italian, German, Russian, Latin or Greek to the 200-level is required.

13. English

First and Second Years: English 100 (Lit. and Comp.), English 200.

Senior Years: English 304 (in place of English 303), one of English 331, 360, 365, 366; one of English 321, 370, 375, 380, 389, 390, 391, 392, 393; one of English 309, 320, 329, 340, 420, 429, 440, 450, 454.

Note: One of French, Spanish, Italian, German, Russian, Latin or Greek to the 200-level is required.

14. French

First Year, 120*; Second Year, 220*; Third and Fourth Years, 9 units in French courses numbered above 300 including 302.

Note: Election of one course in Latin, Greek, another modern language, or linguistics, is recommended.

15. Geography

First and Second Years: Geography 101 and 100 or 201; History 100 or 206; History 202 or Political Science 101.

Senior Years: (a) one of Geography 300, 301, 304, 305, 306, 307, 310, 312, 414, 415, Geology 412; (b) one of Geography 404, 405, 406, 407, 408, 409, 410, 414, 415, 420; (c) three additional units from (a) or (b) or Geography 445 with special permission.

Note: Election of an additional course in Anthropology, Economics, History, Political Science, Sociology or Commerce 331 is recommended.

16. German

For students wishing to major in German and a second language other than English, French is strongly recommended.

First and Second Years: German 100, (110 or 120), German 200 (210), German 223.

Senior Years: German 310, 323 or 411, plus one additional senior course in German Literature (German 350 is strongly recommended).

Note: Election of an additional course in German is strongly advised and election of one course in Latin, Greek, another modern language, or linguistics, is recommended.

*With the consent of the Department of Romance Studies, courses numbered 110, 210, may be offered instead of 120, 220, but in such cases 223 must be completed before 302 can be taken. Students who do not achieve second class standing in French 220 will be required to take 223 before taking 302.

17. Guidance

It will be necessary to complete the fourth or fifth year of this programme in attendance at a regular winter session. Field work will be required.

First and Second Years: *Economics 101 or Economics 200; Sociology 200.

Senior Years: Sociology 420; **Psychology 311, Sociology 306, or **Psychology 308.

One of: Sociology 301, Sociology 315, **Psychology 307, **Psychology 400.

Note: 1. Education 411 must be elected in the fifth year.

2. *Permission of the Department of Economics is required to take this course.

3. **Prerequisite: Education 332.

18. History

First and Second Years: (a) All students majoring in History are required to take History 100, preferably in their First Year. In the Second Year students will choose one field from among the following: American (History 212); Asian (Asian Studies 205); British (History 201); Canadian (History 202); Commonwealth (History 201 or 205); Mediaeval and Renaissance (History 204); Modern European (History 204). (b) a 200-level course in Anthropology, Economics, Political Science, Sociology or History 206. (c) a Geography course at the 200-level or above. (May be deferred to Third or Fourth Year.)

Third and Fourth Years: Three courses (9 units) are to be taken of which two courses (6 units) are to be in the field selected in the Second Year. The third course to complete the major may be selected either from the regular History Department offerings numbered 300 and above and outside the chosen field (without additional prerequisites) or from the list of courses acceptable for credit in History.

If Canadian History is not the chosen field, the third course to complete the major must be a Canadian History numbered 300 or above, or Political Science 302 or 401.

Note: Election of an additional course in Geography, Anthropology, Political Science, Sociology, Economics or Commerce 331 is recommended.

19. Home Economics (courses to be taken in sequence)

First and Second Years—Home Economics 101 (1½), 102 (1½), 104 (1½), 105, 201 (1½).

Senior Years—Home Economics 300 and 310 (1½) and 1½ to 4½ units chosen from Home Economics 401, 403 (1½), 421.

20. Industrial Education (Double Major)

Academic Phase: English 100, 200, 303; one of History 100, Geography 100, History 202 (recommended for students from outside Canada), History 206; Physics 103 or 110 or 120 or Chemistry 101 or 102, or 110; Mathematics 120; elective.

Professional Phase: 24 units of education courses required of all Bachelor of Education candidates; student teaching. (F.A. 405 may be elected with permission of the Director in place of one of the education electives of the 5th year).

Technical Phase: Offered in the Division of Industrial Education, 3650 Willingdon Avenue, Burnaby 2, B.C.: Education 230, 252, 350, 351, 353, 360 and one of the following specialties:

(a) **Construction Specialty:** Education 357, 450, 458(c), 459 and six units from Education 359, 452, 463, 464, 465.

(b) **Electrical - Electronic Specialty:** Education 356, 361, 458(a), 459 and six units from Education 355, 358, 456, 465, 466.

(c) **Metal and Mechanics Specialty:** Education 354, 451, 458(b), 459 and six units from Education 453, 454, 457, 465, 467.

Regular Schedule: First Year—English 100; one of History 100, Geography 100, History 202 or 206; Physics 103 or 110 or 120, or Chemistry 101 or 102 or 110; Mathematics 120; elective.

Second Year—at 3650 Willingdon Avenue, Burnaby 2, B.C. Education 230, 252, 350, 351, 353, 360, 298.

Third Year—at 3650 Willingdon Avenue, Burnaby 2, B.C. Specialty (a), (b) or (c); 404, 499.

Fourth and Fifth Years—remainder of academic and professional courses required of all Bachelor of Education Secondary candidates.

Accelerated Schedule: Students may, with the permission of the Dean and the Chairman of the Division of Industrial Education, follow an accelerated schedule:

Summer Session: July - August, Education 200 and 332.

Winter Session: September - April, 3650 Willingdon Avenue, Burnaby 2, B.C. Education 230, 252, 350, 351, 353, 360, 298.

Spring Session: May - June, 3650 Willingdon Avenue, Burnaby 2, B.C. Education 404 and 3 prescribed units from a Specialty.

Summer Session: 6 prescribed units from a Specialty. Remainder of Bachelor of Education Secondary programme by Summer Session.

All students who plan to enter Industrial Education should arrange an interview with the Chairman of the Division of Industrial Education, 3650 Willingdon Avenue, Burnaby 2, B.C., before March 31 of the year preceding the technical phase. Enrolment is restricted.

21. Latin

First and Second Years: Latin 120 (or 110), 220 (or 210).

Senior Years: Latin 310 (1½) plus 9 units of Latin courses numbered above 300.

Note: Election of Classical Studies 331 is strongly advised and Greek 100 is recommended.

22. Librarianship

Education 390, 490, 491, 492 (in sequence) and Education 415.

Recommended: English 311.

23. Mathematics (Single Major)

First and Second Years: Mathematics 120, 200 and 202.

Senior Years: Mathematics 300, 306, 308. Recommended: Mathematics 412.

24. Mathematics (Double Major)

First and Second Years: Mathematics 120, and either Mathematics 200 and 202, or Mathematics 220 and 221.

Senior Years: Either Mathematics 300, 306, 308, or Mathematics 320, 321, 322, Mathematics 412 and 6 additional units in Mathematics chosen in consultation with the Mathematics Education Department.

25. Music

Prerequisites: Fine Arts 101 or Music 120 and previous music training satisfactory to the Faculty of Education. First and Second Years: Music 101, 201. Senior Years: Music 302, 303, 401 and one music elective. Strongly recommended: two of Music 140 (2), 141 (2), 142 (2).

26. Physical Education

Activity Courses—9 units. (Consult the School of Physical Education calendar concerning these course requirements.)

Theory Courses—6 units as follows: P.E. 262; 260 or 360; 3 units chosen from P.E. 361, 460, 462, 470.

27. Physics (Single Major)

First and Second Years: Physics 103 or 110 or 120, and 200, Mathematics 120 and 202, Chemistry 101 or 102 or 110, Biology 101, Geology 105 (may be deferred until third or fourth year).

Senior Years: Physics 300, 308, 400.

Note: only one of English 200 or 303 need be taken.

28. Physics (Double Major)

First Year: Physics 120 or 110 (or 103), Chemistry 101 or 102 or 110, English 100, Mathematics 120, and either Biology 101 or one of History 100, Geography 100, History 202 or 206. If Biology 101 is elected the History or Geography may be deferred to the second year.

Second, Third and Fourth Years: Biology 101 if not taken in first year, Mathematics 202 (or 220) and 300, Geology 105, Physics 200, 300, 308, 400, 419 (2) or 429 (3), and five additional units (or four if 429 is taken). Geophysics 200 (2) and Physics 441 (1) are suggested.

Additional recommended courses: Mathematics 200 and 410.

Note: Only one of English 200 or 303 need be taken.

29. Russian

For students wishing to major in Russian and a second language other than English, French is strongly recommended.

First and Second Years: Russian 100 and 200. Recommended: Russian 203.

Senior Years: Russian 300, 400 and 401.

Note: The election of an additional course in Russian language or literature is strongly advised, and the election of Linguistics 200 or English 309 is highly recommended.

30. Spanish

For students wishing to major in Spanish and a second language other than English, French is strongly recommended.

First and Second Years: Spanish 100 or 110 and 200; Third and Fourth Years, Spanish 300 and six units in Spanish courses numbered 301 or higher. Portuguese 300 may be substituted for one advanced course in Spanish.

31. Theatre

First and Second Years: Theatre 120 and 300.

Senior Years: Theatre 400, one of Theatre 310, 320, and one of Theatre 301, 350, 410, 420 (chosen in consultation with the Department of Theatre).

32. Zoology (double major)

First and Second Years: Biology 101, Zoology 202, Chemistry 101 or 102 or 110, Physics 103 or 110 or 120, Mathematics 120 or 110, Geology 105 (may be deferred to the Third or Fourth Year).

Senior Years: Chemistry 230, 18 units of Biological Science including Zoology 304, Biology 234 (1½), and 321 (1½) or 322 (1½), one of Botany 302, 303, 304, 305, at least 6 additional units in Zoology, and at least 3 additional units in Zoology, Biology, Microbiology or Botany. The programme should be approved by a member of the Science Department of the Faculty of Education.

Note: Only *one* of English 200, 303 need be taken.

Honours Course

Students who have the required standing at the end of the second year of the Bachelor of Education programme may, after consultation with the Director of the Secondary Division, embark upon an honours programme in a subject widely taught in the secondary schools of British Columbia. Such specialization in a single subject requires completion of at least 84 units of work in the five years of the Bachelor of Education programme.

SCHOOL EXPERIENCES

COLLEGE YEAR	COURSE NO.	OBSERVATION and PARTICIPATION			DEMONSTRATION	
		Fall Term	Spring Term	Post Session	Fall Term	Spring Term
ELEMENTARY PROGRAMME						
First Year A(1) A(2)	Ed. 197 Ed. 197	Observation as arranged 6-8 weeks 6-8 weeks Half days at regular intervals throughout the year.		Nil Nil	As arranged 2-4 2-4	
Second Year & Transfers A(1) A(2)&A(3)	Ed. 297 Ed. 297	Nil 6-8 weeks	Nil 6-8 weeks	Minimum 2-week Minimum 2-week Practicum	As arranged 2-4 2-4	
Third Year A(1)	Ed. 397	Block Practice Nil	Block Practice Nil	2-week Practicum	1 week of observation recommended before University opens in September.	
Fourth Year A(1) A(4)	Ed. 497 Ed. 497	Nil 6-8 weeks	Nil 6-8 weeks	Minimum 2-week Practicum Minimum 2-week Practicum		
SECONDARY PROGRAMME						
Second Year	Ed. 298	As for Ed. 197 (A2) above.	As for Ed.197(A2) above.	Nil	2-4	2-4
Third Year		Nil	Nil	Nil	to be arranged	
Fourth Year	Ed. 498	Nil	Nil	Minimum 2-week Practicum	1-2	1-2
Fifth Year and One Year Graduates	Ed. 499	As for Ed. 297 (A2) above.	As for Ed.297(A2) above.	Minimum 2-week Practicum	2-4	2-4

1. Selected field trips will be undertaken with each of the above courses.
2. The above courses are linked with the regularly held seminars compulsory for all Education students except those in the First and Third Years on the Secondary Programme and Third and Fourth Year regular students on the Elementary Programme.

UNDERGRADUATE COURSES IN EDUCATION

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 200 (3) under Education indicates that Education 200 is a three-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

- | | |
|---|----------------|
| 2 lectures and 3 hours laboratory per week, both terms. | [2-3; 2-3] |
| 1 lecture and 2 hours laboratory per week, first term. | [1-2; 0-0] |
| 1 lecture and 2 hours laboratory per week, second term. | [0-0; 1-2] |
| 2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms. | [2-3-2; 2-3-2] |

102. (3) **Principles of Teaching.**—The psychological bases of learning and teaching; the nature, aims and purposes of education; the application of educational principles in preparing and presenting lessons, and in maintaining discipline. Prerequisite to all further courses in educational psychology for elementary teachers. [3-0; 3-0]

197. (0) **Programme A (1), Seminar and Practice Teaching.**—Seminars to be arranged. Counselling and orientation to teaching. Observation, demonstration lessons and field trips as arranged.

197 (0) **Programme A (2), Seminar and Practice Teaching.**—Seminars to be arranged. Half days observation and participation in Elementary schools at regular intervals throughout the year. Demonstration lessons and field trips as arranged. Individual tuition from faculty adviser.

200. (3) **Introduction to Secondary Education.**—The nature and purposes of secondary education, and appropriate methods, techniques, and organization. Education 200 and 298 are combined for final evaluation, but a passable standard in each is required. [3-0; 3-0]

201. (1½) **Curriculum and Instruction in Elementary Science.**—A study of (a) the curriculum organization in science and health for the elementary grades; (b) techniques of instruction in science for these grades. [0-0; 3-0]

202. (1½) **Curriculum and Instruction in History and Geography.**—A study of (a) the method and structure of geography and history as disciplines; (b) the materials, skills, and content required for teaching history and geography in the elementary school. [3-0; 0-0]

203. (3) **Curriculum and Instruction in the Language Arts, and Integrated Subjects of the Primary Grades.**—A study of (a) the curriculum organization; (b) techniques of instruction in these grades. [3-0; 3-0]

204. (3) **Curriculum and Instruction in the Language Arts.**—A study of (a) the curriculum organization in the language arts particularly in the intermediate grades; (b) techniques of instruction in these subjects and grades. [3-0; 3-0]

205. (1) **Curriculum and Instruction in Art.**—A study of (a) the curriculum organization in art for the elementary grades; (b) techniques of instruction in art for these grades. [2-0; 2-0]

207. (1) **Curriculum and Instruction in Music.**—A study of (a) the curriculum organization in music for the elementary grades; (b) techniques of instruction in music for these grades. [1-0; 1-0]

209. (1) Curriculum and Instruction in Physical Education.—A study of (a) the curriculum organization in physical education for the elementary grades; (b) techniques of instruction in physical education for these grades. [2-0; 2-0]

230. (3) Electricity in Industrial Education I.—D.C. fundamentals and circuits; D.C. motors and generators; signal circuits; electro-chemical devices; D.C. measurement; residential wiring circuits. [3-3; 3-3]

252. (3) Principles of Technical Drawing.—Lettering; descriptive geometry; orthographic projection; sections; auxiliary views; sketching; technical illustrating; fastenings; methods of drawing reproduction; surface development. [2-4; 2-4]

297. (0) Programme A (1) Seminar and Practice Teaching.—Seminars to be arranged. Demonstration lessons and field trips as arranged. Post-sessional practicum. (Minimum two weeks.)

297. (0) Programme A (2) Seminar and Practice Teaching.—Seminars to be arranged. Full days of observation and teaching practice in elementary schools at regular intervals throughout the year. Periods of block practice in fall and spring terms plus a post-sessional practicum (minimum two weeks). Demonstration lessons and field trips as arranged. Individual tuition from faculty adviser. [1-5; 1-5]

298. (0) Seminar and Practice Teaching.—Seminars to be arranged. Half days observation and participation in junior secondary schools at regular intervals throughout the year. Demonstration lessons and field trips as arranged. Individual tuition from faculty adviser. [1-3; 1-3]

301. (3) Introduction to Learning and Evaluation. [2-0; 2-0]

305. (3) Art Education.—A study of the growth and development of art education; discussion and use of various art media; the function and purpose of art in school and society; practical studio activities; modern methods and curricula in art education. Prerequisite: Education 205 (or equivalent). [1-2; 1-2]

306. (3) Health Education.—A functional approach to the health of the child. Child growth and development, deviations from normal health, health instruction, social problems, community health, safety, and international aspects of health. Close contact with the public health agencies will be emphasized. [3-0; 3-0]

307. (3) Music Education.—A study of modern methods, materials, objectives, and philosophy pertaining to the teaching of music in elementary and secondary schools. Prerequisite: Education 207 or equivalent. [3-0; 3-0]

308. (3) Physical Education.—Theory and practice of dance, games and gymnastics for the elementary school. This course is not part of a major in physical education. Prerequisite: Education 209. [2-2; 2-2]

310. (1½) Growth and Development.—Research as it applies to the elementary school child. [3-0; 0-0]

311. (1½) The Nature and Measurement of Learning.—A study of learning and the techniques of evaluation as they apply to the elementary school child. [0-0; 3-0]

331. (3) Psychology of Childhood.—Mental, social, emotional and physical characteristics of pre-school and elementary school pupils; their interests and problems; implications for organization and administration of school systems; observation of children. Prerequisite: Education 102 or equivalent course. [3-0; 3-0]

332. (3) **Psychology of Adolescence.—Development and Adjustment.**
[3-0; 3-0]
333. (3) **Curriculum and Instruction in Pre-School Nursery schools and Kindergartens.**—Planning and developing an educational programme for young children, consideration being given to learning experiences, resources, materials, teaching, and guidance procedures. Laboratory experiences in the Child Study Centre and observation in field settings are included.
[3-0]
334. (3) **The Role of the Teacher in Home and Community.**—An investigation of the problem of parent-teacher co-operation and techniques for developing this; a survey of community services and organizations for children; laboratory experiences in the Child Study Centre and other appropriate centres.
[3-0; 3-0]
336. (3) **Modern Theories of Pre-School Education.**—A theory course intended for teachers and administrators interested in pre-school and primary education. Observation of pre-school procedures in the Child Study Centre.
[3-0; 3-0]
350. (3) **Technology of Woodworking I.**—Fundamentals of bench and machine woodwork; design and layout; hand and machine tool maintenance.
[2-4; 2-4]
351. (3) **Technology of Metalworking I.**—An introduction to bench metalwork and light machine work; lathe and shaper operations; heat treatment of carbon steel; forging; founding; welding and related metallurgy; project planning; teaching aids and shop management.
[2-4; 2-4]
353. (3) **Design in Industrial Education.**—Functional, structural and aesthetic aspects of design applied to Industrial Education projects.
[2-4; 2-4]
354. (1½) **Oxyacetylene and Arc Welding.**—(a) Oxyacetylene; fusion welding mild steel; flame cutting; testing and inspection of welds; bronze welding; silver alloy brazing, aluminum welding. (b) Arc: practice in common types of weld in mild steel; bronze welding.
[1-2; 1-2]
355. (3) **Electricity in Industrial Education II.**—Single and polyphase circuit analysis; alternating current machinery and controls; generation and distribution of electrical energy. Prerequisite: Ed. 230.
[3-3; 3-3]
356. **Electronics in Industrial Education I.**—Fundamental circuits; vacuum tubes and semi-conductor devices as applied amplifiers and power supplies; measurements. Prerequisite: Education 230.
[3-3]
- 357 (1½) **Industrial Coatings.**—Theory and practice of applying industrial finishing materials; manual and mechanical application to wood, metal and synthetic surfaces. Prerequisites: Ed. 350, 351.
[1-2; 1-2]
358. (3) **Electronics in Industrial Education II.**—Data generation, transmission, and receiving systems; principles of HF, VHF, UHF, and microwave communication systems. R.F. measurements. Prerequisite: Ed. 356.
[3-3; 3-3]
359. (3) **Millwork Theory and Practice.**—Furniture and fixture design; layout and production; custom and mass production methods; prefabrication techniques. Prerequisite: Ed. 350.
[2-4; 2-4]
360. (3) **Power Mechanics Theory and Practice.**—Heat engines — internal and external combustion types; fuels; mechanical and hydraulic power transmission; power control.
[3-3; 3-3]

361. (1½) **Measurement Theory and Practice.**—Principles and practices of electrical measurements; design and construction of measurement devices. Prerequisites: Ed. 230, 356. [1-2; 1-2]

365. (3) **Oral French for Elementary Teachers.**—A course designed to meet the needs of those planning to teach French in the elementary school and for those who need additional work in teaching by the direct method in secondary schools. (Summer Session only.) [3-0; 3-0]

375. (3) **Office Organization and Secretarial Practice.**—Office organization, planning and production problems; educational requirements; personnel practices; records management; reports and correspondence; changes resulting from introduction of new equipment; the development of advanced typewriting, shorthand, and transcription skills; field trips. [2-4; 2-4]

390. (3) **The Library in the School.**—The objectives, functions and administration of libraries in elementary and secondary schools. [3-0; 3-0]

397. (0) **Programme A (1) Seminar and Practice Teaching.**—A recommended one week pre-sessional observation period in the schools in September. Post-sessional practicum of two weeks with preliminary seminars.

400. (3) **Philosophy of Education.**—An introductory course in which consideration is given to the philosophical foundations of education and to the practical bearings of theory upon curriculum content and classroom practice in our schools. [3-0; 3-0]

401. (3) **Theoretical Bases of Educational Psychology.**—A systematic study of important theories in educational psychology in the areas of learning, personality and measurement; contemporary schools of psychological thought. Prerequisites: Education 301 or Education 102.

404. (3) **Curriculum and Instruction in Specific Secondary School Subjects.**—All courses in this area include, for the particular subject under discussion, a consideration of the objectives, the scope and content of the curriculum, the learning process applied to the particular subject, together with methods of presentation, and the materials of instruction. Consideration will also be given to evaluation of pupil progress, and diagnosis of and remedy for individual and group difficulties. Students are required to take Education 404 courses corresponding to each of their teaching majors and are advised to audit an additional one. The following subjects indicate the range of options offered to students: Biology and General Science, English, Chemistry and General Science, French, Latin, German, Russian, Spanish, History and Social Studies, Geography and Social Studies, Mathematics, Art, Guidance, Physical and Health Education, Physics and General Science, Music, Commerce, Industrial Education, Home Economics, Agriculture, Theatre. [4-0; 4-0]

405. (3) **Curriculum and Instruction in the Primary Grades—Advanced.**—Current research findings; trends and problems dealing with personality development, classroom management, and the programme of instruction in grades one, two, and three, with reference to readiness in the kindergarten. [3-0; 3-0]

406. (3) **Curriculum and Instruction in the Intermediate Grades—Advanced.**—This course is designed for a more advanced study of the intermediate grade pupils and curriculum, Grades 4 to 7 inclusive. Current research findings; practices and evaluation in the subject matter fields. [3-0; 3-0]

407. (3) **Introduction to the Study of Exceptional Children.**—A course covering all groups of exceptional children in diagnosis, classification, treatment. [3-0; 3-0]

408. (3) **Teaching the Mentally Superior.**—The characteristics, needs and abilities of mentally superior and specially talented children; identification, classification, educational research; planning suitable educational programmes at both elementary and secondary levels; methods of teaching. [3-0; 3-0]

409. **Science Education.**—Advanced techniques of demonstration. Collecting and preserving of materials. Study of the research in elementary science teaching and comparative curricula. Required teaching practicum in science. Prerequisites: two First Year science courses, Education 201 (or equivalent). Education 309 must be taken prior to or concurrently. [2-2; 2-2]

410. (1½) **The British Columbia School System.**

411. (3) **Foundations of Vocational Planning.**—Theories of vocational development, occupational information and trends, counselling and the process of vocational choice. Laboratory and field experience will be included. [2-1; 2-1]

412. (3) **Introduction to Adult Education.**—Survey of present programmes for adult education including study of methods, institutions, and conditions under which it has developed in modern society. [3-0; 3-0]

414. (3) **Audio-Visual Education.**—The role of the teacher in communication, the study of various materials related to learning, and the sources, selection, effective utilization and evaluation of these materials. [2-2; 2-2]

415. (3) **Developmental Reading.**—The problems of teaching reading, grades 1-12; the nature and psychology of reading; the basic skills and abilities; evaluating reading; remedial reading in the classroom. [3-0; 3-0]

416. (3) **Speech Education.**—Speaking and thinking. Effect of stress and fatigue on voice production. Practical application and practice. [3-0; 3-0]

417. (3) **Educating the Slow Learner and the Emotionally Handicapped.**—An examination of techniques for identifying and educating the emotionally handicapped child and the slow-learning child. Prerequisite: Ed. 407. [3-0; 3-0]

418. (3) **Introduction to Special Education in Secondary Schools.**—Psychological, sociological and curriculum problems in teaching the children in the occupational programme. School and community relations. [3-0; 3-0]

419. (3) **Introduction to Speech Correction.**—A survey of the speech defects of children to make the teacher aware of the problems and to acquaint him with some basic skills for dealing with speech problems. [3-0; 3-0]

420. (3) **Educating the Mentally Retarded.**—The identification, education, and training of children and youth with retarded mental development. Prerequisite: Ed. 407. [3-0; 3-0]

422. (3) **Phonetics and Voice Science.**—An introduction to the phonetic alphabet designed to give the classroom teacher a practical knowledge of the alphabet of sound, the mechanisms used in the production and articulation of speech sounds, and their application to the speech problems of children. No prerequisite required. [3-0; 3-0]

423. (3) **Problems of the Deaf and Hard-of-Hearing.**—An introductory course dealing with the causes of deafness, types of hearing loss, and management of children with a hearing loss. Clinical observation. Prerequisite: Education 407. [3-0; 3-0]

424. (3) **Principles of Speech Correction.**—Some basic principles for the understanding and handling of speech disorders such as simple articulation defects, stuttering, and others, within the framework of the classroom and the school. Practical experience and observation in a clinical setting to be arranged. Prerequisite: Education 419. [3-0; 3-0]

428. (1½) **Mental Health in the School.**—Appraisal of current concepts of mental health, mental health hazards; prevention and treatment. Roles of the teacher and other school personnel. [2-0; 2-0]

430. (3) **History of Education.**—An introductory course in the history of education from the time of ancient Greece to the present. [3-0; 3-0]

432. (3) **Adolescent Psychology.**

Note: Students who have already obtained credit for Education 332 may not elect Education 432. [2-0; 2-0]

433. (3) **The Personal and Social Development of the Adult.**—Major determinants of personality problems in vocational development and adjustment.

435. (1½) **Introduction to the Study of Individuals and Groups.**

449. (3) **Supervised Study.**—This course is available only to outstanding students approved by the Director in their final year to undertake a research investigation into a particular problem.

450. (3) **Technology of Woodworking II.**—Design and layout of contemporary furniture; elementary finishing; production principles and techniques. Prerequisite: Education 350. [2-4; 2-4]

451. (3) **Technology of Metalworking II.**—An intermediate course in bench metalwork and light machine work; operations on lathe, shaper, surface grinder and milling machine; heat treatment, forging, welding and related metallurgy; students design and manufacture individual items. Prerequisite: Ed. 351. [2-4; 2-4]

452. (3) **Technology of Building Construction I.**—Design and construction of single unit residential buildings; custom and prefabrication methods; western platform frame and post and beam construction. Prerequisite: Education 350. [2-4; 2-4]

453. (3) **Automotive Theory and Practice I.**—General construction of power plant, auxiliary systems, fuels, carburetion, lubrication, cooling systems, clutch, gear box, rear axles, drive shafts, universal joints, front suspension and steering gears, brakes. Prerequisites: Ed. 360, 351. [2-4; 2-4]

454. (3) **Pattern-Making and Foundry Practice.**—Influence of foundry techniques and metallurgy on design; practical application of various types of patterns; core box making; green sand moulding; coremaking; gating; practice; melting and pouring brass, iron, and aluminum alloys. Prerequisite: Education 351. [2-4; 2-4]

456. (3) **Electronics in Industrial Education III.**—Transducers; Processors; Transmission; Deprocessing; Transducers for Readout and Display. Prerequisite: Education 356. [3-3; 3-3]

457. (3) **Technology of Metalworking III.**—Methods of forming, joining, machining heat treatment and finishing of metals. Design analysis and the development of manufacturing techniques. Prerequisite: Education 451. [2-4; 2-4]

458. (1½) **Problems in Graphic Representation.**—Specific drafting problems associated with each of the following specialties: (a) Construction: mill-work and furniture drawings, small boat design; national and local building

codes; descriptive geometry. (b) Metals-Mechanics: surface development; gearing; descriptive geometry. (c) Electricity-Electronics: layout and representation of problems in electrical and electronic design. Prerequisite: Education 252. [1-2; 1-2]

459. (3) **Materials Technology in Industrial Education.**—Wood and materials directly derived from wood; metals and alloys; synthetics; adhesives; physical testing of materials. Prerequisites: Education 350, 351. [3-3; 3-3]

460. (3) **An Introduction to Educational Administration.**—Historical, social and conceptual views of administration, administrative theory, purposes, functions and tasks. [3-0; 3-0]

461. (3) **Educational Diagnosis and Remedial Instruction.**—Interpretation of informal and standardized test scores in educational diagnosis; estimates of actual and optimum levels of individual achievement; individual differences as factors affecting performance; methods of encouraging the optimum achievement of individuals; methods and practice materials for remedial teaching. Students intending to take both Education 461 and Education 415 should take Education 415 either prior to or concurrently with Education 461. [3-0; 3-0]

462. (3) **Remedial Reading.**—Identification of retarded readers; diagnosis and treatment of disabilities in reading; selection of materials; organization of the special remedial reading classroom. Practice teaching in remedial classes. Prerequisite: Education 415 or equivalent. [3-0; 3-0]

463. (3) **Technology of Synthetic Materials.**—Principles and practices of synthetic materials lay-up; forming and extrusion; design and production of moulds and plugs; die casting. Prerequisites: Ed. 350, Ed. 351. [2-4; 2-4]

464. (3) **Technology of Building Construction II.**—Design and construction of industrial commercial buildings; level and transit; estimating and contracting. Prerequisites: Ed. 350, Ed. 452. [2-4; 2-4]

465. (3) **Technical Problem.**—This course gives the student the opportunity to conduct directed study in an area within his technical field of specialization. Study will culminate in a written paper. Prerequisites: Completion of a technical specialty or equivalent. [1-5; 1-5]

466. (3) **Problems in Electrical Equipment Production.**—Fabrication and assembly of electrical and electronic equipment; techniques applicable to the school situation; evaluation of design and manufacturing technique. Prerequisites: Ed. 230, Ed. 356. [3-3; 3-3]

467. (3) **Automotive Theory and Practice II.**—Advanced automotive design and repair; diagnosis of mechanical and electrical faults; evaluation of modern servicing procedures. Prerequisite: Ed. 453. [2-4; 2-4]

470. (3) **Educational Sociology.**—Factors related to the social structure of modern western civilization which have significant relevance to education and to the educability of children. [3-0; 3-0]

481. (1½) **Introduction to Education Research.** [1-1; 1-1]

482. (1½) **Educational Statistics.**—An introduction to Statistical Theory with special reference to problems in Education. [1-1; 1-1]

490. (3) **Book Selection and Evaluation.**—Criteria; aids; sources; reading interests; individual and group reading guidance. [3-0; 3-0]

491. (3) **The Acquisition and Organization of Library Materials.**—The principles and methods of acquiring, classifying, cataloguing and organizing of book and non-book materials. [2-2; 2-2]

492. (3) **The School Library: Sources of Information.**—A basic course in the use of books and libraries with special emphasis upon the resources and methods for locating educational information and upon the techniques for teaching the use of school libraries. [3-0; 3-0]

497. (0) **Programme A (3) Seminar and Practice Teaching.**—Seminars to be arranged. Full days of observation and teaching practice in elementary schools at regular intervals throughout the year. Periods of block practice in fall and spring terms plus a post sessional practicum (minimum two weeks). Demonstration lessons and field trips as arranged. Individual tuition from faculty adviser. [1-5; 1-5]

498. (0) **Seminar and Practice Teaching.**—Seminars at convenient intervals during the year. Minimum two-week post-sessional practicum in secondary schools. Demonstration lessons may be arranged. [1-3; 1-3]

499. (0) **Seminar and Practice Teaching.**—Seminars to be arranged. Full days of observation and teaching practice in secondary schools at regular intervals throughout the year. Periods of block practice in fall and spring terms plus post-sessional practicum. (Minimum two weeks.) Demonstration lessons and field trips as arranged. Individual tuition from faculty adviser. [1-5; 1-5]

Fine Arts — Art Education

101. (3) **History of the Fine Arts.**—History of music, art and architecture, with emphasis upon the cultural development of mankind through the ages. Appreciation and understanding will be encouraged through illustration and discussion of major works. [3-0; 3-0]

300. (3) **Introduction to the Plastic and Graphic Arts.**—Experiment and study of various media of art expression as a basis for advanced work for an art major. This course is an introduction to the four major areas, painting, ceramics, design and print-making. Students will be expected to submit a sketch book of work as part of the final mark.

301. (3) **Drawing and Composition.**—A basic course in drawing in various media. A study of the fundamentals of composition and picture analysis. Students will be expected to submit a sketch book of work as part of the final mark. [3-0; 3-0]

302. (3) **Drawing and Painting.**—Designed to form the basis for any advanced work towards an art major. The fundamentals of both techniques will be explored using still life, figure and landscape. Students will be expected to submit a sketch book of work done outside of class as part of the final mark.

303. (3) **Ceramics and Modelling I.**—Introduction to ceramics and modelling with emphasis upon the preparation of clays, use of glazes and kiln-firing techniques. Demonstration and introduction to wheel techniques. (This course will require extra laboratory time.) Prerequisites: Fine Arts 300 and 302, or equivalent courses.

305. (3) **Design I.**—This course will include studio experiment in both two and three dimensional design problems with the purpose of developing a fuller understanding of the fundamental design principles. Prerequisites: Fine Arts 300 and 302 or equivalent courses.

307. (3) **Graphic Arts I.**—This course includes instruction in the basic techniques of relief printing (lino cuts, woodcuts, wood engravings); also experimental techniques in silk screen printing. Extra time will be spent in laboratory discipline. Prerequisites: Fine Arts 300 and 302 or equivalent courses.

401. (3) **Painting I.**—The skills and techniques of the medium will be developed by experiments and problems. Studio and outdoor subjects will be used. A sketch book must be submitted as part of the final mark. Prerequisites: Fine Arts 300 and 302 or equivalent courses.

402. (3) **Painting II.**—The skills and techniques of the medium will be developed by experiments and problems. Studio and outdoor subjects will be used. A sketch book will be submitted as part of the final mark. Prerequisite: Fine Arts 401 or equivalent course.

403. (3) **Ceramics and Modelling II.**—Advanced ceramics and modelling with specialization in the use of the potter's wheel, molds and casting, firing techniques; investigation of local and imported clay; glazing research. (This course will require extra laboratory time.) Prerequisite: Fine Arts 303 or equivalent course.

404. (3) **Essay or Special Study.**—An extensive study of a particular field of fine arts or art education. Experimental research will be carried out under the direction of the Faculty of Education. The essay must be submitted in final form on or before the end of sessional examinations.

405. (3) **Design II.**—This course will apply experiment and technique to specific design problems with emphasis on such aspects of design as interest decoration, industrial design and fabric design. Prerequisite: Fine Arts 305 or equivalent course.

407. (3) **Graphic Arts II.**—This advanced course will include study in intaglio printing (etching, drypoint) as well as planographic printing (lithography). Emphasis will be placed on creative experimentation in these two graphic art techniques. Prerequisite: Fine Arts 307 or equivalent course.

413. (3) **Ceramics and Modelling III.**—A special study in an advanced field of ceramics and modelling. Prerequisites: Fine Arts 303 and 403 or equivalent courses.

415. (3) **Design III.**—A special study in an advanced field of design. Prerequisites: Fine Arts 405 or equivalent courses.

417. (3) **Graphic Arts III.**—A special study of an advanced field of graphic arts. Prerequisites: Fine Arts 407 or equivalent courses.

General Science

309. (3) **General Science for Elementary School Teachers.** — General science as a systematic study of our environment and man's relation to it will cover such topics as living things, matter, energy, earth science, and the universe. Techniques of science, the improvisation and acquisition of necessary equipment, utilization of community resources. The course is intended to provide teachers with a broad background for teaching general science. [3-2; 3-2]

GRADUATE PROGRAMMES IN EDUCATION

The University offers, through the Faculty of Graduate Studies, graduate degrees in Education—the Master of Arts, the Master of Education, and the Doctor of Education. The instruction and guidance is given by the Faculty of Education, but admission, residence requirements and standards are set by the Faculty of Graduate Studies. Requirements may include a language which may be satisfied by the completion of French 210 or 220, German 200, Russian 200, or by means of a reading examination administered by the Faculty of Education. Candidates who are deficient in the language requirement should consult the director of graduate studies in the Faculty.

Admission to all courses leading to a graduate degree requires registration with the Faculty of Graduate Studies and full approval from the Faculty of Education. Courses taken prior to this registration and without the approval of the Faculty are not acceptable as credit towards an advanced degree. Those who wish to embark on a course for a Master's degree and have met the requirements, should seek an interview with the Director of Graduate Studies, or a person appointed by him, to gain approval for a planned sequence of courses, and should apply for registration. Throughout the time that a candidate is working towards a graduate degree, he will be under the guidance of a properly appointed adviser who will assist in the preparation of the programme and to whom he must make a regular report on his progress. All programmes leading to a Doctor of Education degree are individually arranged by the director of graduate studies in collaboration with a designated member of the department.

Requirements for Admission to M.A. in Education and M.Ed.

The following five categories of persons are admissible to Master's degree courses:

1. Those with B.A. (or its equivalent in another Faculty) with Second Class or higher standing and University postgraduate teacher training (one year) with Second Class or higher standing who have:
 - (a) Subsequent to the postgraduate Education Year, 6 units of Education courses numbered 300 or above with at least Second Class standing in each course.*
 - (b) First Class standing in at least 6 units of Education courses numbered 300 or above, taken in or subsequent to the postgraduate year*, or First Class standing in six units of senior academic course work appropriate to advanced study in Education*.
2. Those with B.A. (or its equivalent in another Faculty) with Second Class or higher standing and Normal School (one year) who have: First Class Standing in at least 6 units of Education courses numbered 300 or above, taken *subsequent* to Normal School.
3. Those with B.Ed. (Secondary) with Second Class or higher standing who have: First Class standing in at least 6 units of senior professional Education courses normally taken in the Fourth and Fifth Years, or First Class standing in six units of senior academic course work appropriate to advanced study in Education*.
4. Those with B.Ed. (Elementary) with Second Class or higher standing who have:
 - (a) At least 15 additional units of senior academic and/or professional work beyond the B.Ed. (Elementary) level, with an average of not less than 65%.
 - (b) First Class standing in at least 6 units of senior level professional Education courses, or First Class standing in six units of senior academic course work appropriate to advanced study in Education*.
5. Those with a university degree with a standing sufficient for admission to a Master's degree course at this University but with no teacher training but have:
 - (a) Sufficient experience in adult or pre-school education to satisfy the Faculties of Graduate Studies and Education that teacher training requirements may be waived.

- (b) First Class standing in at least 6 units of graduate work in Education taken *subsequent* to the university degree*, or First Class standing in six units of senior academic course work appropriate to advanced study in Education*.

Requirements for the M.A. Degree in Education:

- (a) The completion of fifteen units of graduate courses, at least 3 of which, but not more than 6, must be taken in an academic subject outside the Faculty of Education and related to the candidate's research project, and taken during at least one full academic year in resident graduate study.
- (b) A thesis.

Requirements for the M.Ed. Degree

The M.Ed. degree makes provision for a more general study, at an advanced level, of several fields. At least 3, but not more than 15 units of further study in an academic subject, are required. Arrangements for such work must be made in consultation with the director of graduate studies and the head of the department concerned. This work must be in a subject for which the candidate's undergraduate programme has prepared him for advanced study. The degree need not entail research followed by a thesis; instead the amount of course work is increased to 21 units.

Every candidate for the M.Ed. degree will be required to pass a comprehensive examination covering his major field of specialization and other areas related to his Master's programme. These examinations will be available twice a year, prior to graduation in April and at the end of the summer session in August. The comprehensive examination may be both written and oral. Application for permission to take the comprehensive examination must be submitted in writing to the office of the Director of Graduate Studies by March 1 for the April examination or by July 1 for the August examination.

Residence Requirements and Transfer of Credit

The Ed.D. and M.A. degree programmes require residence during winter sessions. The Master of Education programme may be completed by summer sessions.

Graduate courses taken at another university are not normally acceptable as credit towards these degrees unless permission prior to undertaking the course has been given. Correspondence and off-campus extra-session courses may be offered as prerequisites, but they are *not* acceptable in the Master's programme. Students who hold full-time teaching positions may not undertake more than three units (one course) for credit during a winter session.

Major Fields of Specialization

All courses at the Master's level in Education are grouped for administrative convenience into four major fields: Educational Psychology, Administration and Supervision, Curriculum and Instruction, and History and Philosophy. For an M.A. degree, a student is required to take Education 581 and at least 9 units of advanced work in the major field in which the thesis will be written. For an M.Ed. degree, a student must elect at least 9 units from a major field, either professional or academic. The remaining units should include courses from separate major fields of specialization.

The organization of the Senior Education Courses under the four major fields, is as follows:

*Courses submitted as prerequisites must be appropriate to the academic and professional background of the candidate.

Education Psychology: 331, 332, 401, 407, 408, 411, 417, 420, 423, 428, 432, 433, 435, 461, 481, 482, 518, 530, 533, 535, 536, 568, 571, 573, 578, 579, 581, 582, 584, 585.

Administration and Supervision: 551, 552, 553, 556, 557, 558, 559, 560, 569, 576.

Curriculum and Instruction: 333, 390, 405, 406, 409, 414, 415, 416, 417, 419, 420, 490, 491, 508, 516, 517, 518, 540, 541, 542, 562, 563, 564, 565, 566, 567, 568, 572, 574.

History and Philosophy: 336, 400, 412, 430, 470, 514, 519, 521, 522, 523, 525, 570, 575, 577, 583.

Note: Normal School graduates may use any of these courses as prerequisites to the Master's programme, but Education 404 and 410 may not be taken for credit on the Master's programme. No course credited to a previous degree may be applied to the Master's programme.

Programmes for the Ed.D.

Programmes for the Ed.D. will be arranged to meet the needs of individual applicants, within the resources of the Faculty of Education and other departments of the University.

Admission

1. To become candidates for a doctoral degree graduate students must apply by letter to the Registrar. Applications should be submitted before March 1 and will not be accepted after August 1.

2. Candidates for the Ed.D. degree must satisfy the Executive Committee of the Faculty of Graduate Studies that they are competent to proceed to the course of study proposed and must hold a Master's degree (or equivalent) in Education, with standing of sufficient quality to warrant admission to the programme.

Candidates will normally be required to spend a minimum of two winter sessions at the University.

3. Each candidate must satisfy the Executive Committee of the Faculty of Graduate Studies of his competence in the English language. The choice and number of languages other than English, and the standard and competence required in such languages, will be determined by the department in which the candidate intends to write his thesis.

4. As the number of candidates that can be accommodated is limited, students, no matter how well qualified, can be accepted only if there is a vacancy in the specific field in which they propose to major.

5. Since candidates for the Ed.D. degree are expected to devote full-time to their reading, courses, and research, candidates who undertake remunerative employment must obtain prior permission of the Executive Committee of the Faculty of Graduate Studies through the department or departments concerned. They may be required to spend additional time in residence or supervised study before coming up for the final examination. The amount and nature of this additional time will be determined by the Executive Committee in consultation with the departments concerned.

6. Agreement to the publication of a suitable abstract of the doctoral dissertation is prerequisite to the awarding of the doctoral degree. A fee to meet the cost of publication will be assessed each candidate during the final year of candidacy; the fee (\$30) must be paid before the thesis is submitted in its final form to the candidate's committee.

Courses of Study

1. The work of each candidate will be supervised by a Candidate's Committee consisting of not less than three members, at least one of whom may

be chosen from a department other than that in which the candidate is writing his thesis. This Committee will assist the candidate to plan his work, supervise his research, and direct the preparation of his thesis.

2. Upon registration an applicant must outline his proposed programme of study on forms obtainable in the Registrar's office. The programme must be approved both by the Candidate's Committee and by the Executive Committee of the Faculty of Graduate Studies. Work for the Ed.D. degree will consist of seminars, assigned readings, consultations, and such formal courses as may be deemed essential for the fulfilment of the requirements for the degree. A major part of the candidate's work will consist of a thesis embodying the results of original and independent research. The Executive Committee of the Faculty of Graduate Studies shall require the thesis to be submitted to an outside examiner or examiners approved by the Committee. It may also require the publication of the thesis in whole or in part as a condition of granting the Ed.D. degree.

3. At the doctoral level the requirements of different subjects and departments vary so greatly that the precise amount of course work needed cannot be specified in a uniform fashion. It shall be the duty of each candidate's committee to recommend the kind and number of courses to be taken by the candidate. The recommendation of the candidate's committee regarding the course work shall be subject to the approval of the Department concerned and of the Executive Committee of the Faculty of Graduate Studies.

4. Unless, in the opinion of the Executive Committee of the Faculty of Graduate Studies, the delay has been justified by circumstances that are altogether exceptional, candidates who have not received their degree at the end of six winter sessions will be required to withdraw.

Examinations and Thesis

1. The progress of all Ed.D. candidates will be reviewed in the spring of each year, and the Executive Committee of the Faculty of Graduate Studies may require any candidate to withdraw if his work has not been satisfactory. If a candidate for the degree of Ed.D. fails to obtain 65 per cent in any course, the Executive Committee of the Faculty will deal with the matter after consultation with the department concerned.

2. The examinations required will be determined by the department concerned, with the approval of the Executive Committee of the Faculty of Graduate Studies. These will consist of the following: (a) course examinations, in which candidates are required to secure at least Second Class standing; (b) examinations to test the candidate's ability to read the foreign languages required for his programme of study; (c) a comprehensive written and/or oral examination, which normally will be held when the candidate has completed all course work required, and which is intended to test his grasp upon his chosen field of study as a whole; and (d) a final oral examination for the degree.

3. Examinations in the formal course work must be completed before a candidate takes the final oral examination.

4. A candidate's thesis must be presented in the form described in the leaflet entitled *Preparation of Graduate Theses*, copies of which may be obtained from the Registrar.

Courses for Credit

Only the following courses will be accepted for Ed.D. credit:

(a) Graduate courses numbered 500 or above offered in the department or departments concerned, provided credit has not already been obtained for such courses.

(b) Certain courses numbered 400 or above in related subjects as approved in particular cases on the recommendation of the department concerned.

GRADUATE STUDIES

The following courses are those applicable to the Master's and Doctoral degrees in Education. On occasion, courses at the 500-level may be taken for undergraduate credit when approved by the Director of Elementary or Secondary Education.

508. (3-6) **Review of Research in Methods of Teaching Specific School Subjects.**—Three units will be given for each course in an individual subject. No more than 6 units may be credited towards a Master's degree. Each course reviews the philosophy, purpose and function of the subject in school. Studies are made of recent research on curriculum organization, on particular methods of teaching, on the use of material aids, on factual comprehension and attitude testing. Prerequisite: Education 204 or 404.

514. (3) **Foundations of Adult Education.**—Historical, political and social factors which influence movements and programmes of adult education. Developments in Britain, the United States, and Canada. Philosophical problems related to the extension of adult education. Prerequisite: Education 412.

516. (3) **Mass Media and Adult Education.**—The major information facilities and the context for adult learning they create. Types of learning resulting from each of the major media, by means of various experiments.

517. (3) **Health Education in Schools.**—The philosophy, the administration and the teaching of health in schools. School medical service, the healthful school environment. Methods and materials of teaching in schools from Grade 1 through Secondary School.

518. (3) **Methods of Adult Education.**—Factors involved in adult learning. Learning theory, attitude change, group dynamics and special aspects of aging, and methods by which curriculum is created. Prerequisite: Education 412.

519. (3) **History of Canadian Education.**—The historical growth of public education in Canada from the French regime to the present. The development of provincial public school systems and Canadian educational thought and practice. Prerequisite: At least one of Education 400, 430, 470, or similar courses taken at another university; or History major.

521. (3) **Advanced Seminar in Philosophy of Education.**—Current trends in educational philosophy; social implications of current educational theories. Prerequisite: Education 400.

522. (3) **The Logic of Teaching.**—Analysis and study of the logical operations used in teaching. Prerequisite: Education 400, or Philosophy 200 or 212, or consent of the instructor.

523. (3) **Comparative Education.**—Comparative analysis of the social, economic, and political determinants of the organization and administration of selected foreign educational systems. Prerequisite: At least one of: Education 400, 432, or 470.

524. (3) **Advanced Seminar in Comparative Education.**

525. (3) **Social History of American Education.**—The interrelationship of education and social developments in the U.S.A. from the colonial period to the present. Prerequisite: One of a senior history course, Education 400, 430 or 470.

530. (3) **Psychology of Learning.**—Intraserial phenomena, maturation, effect, frequency, transfer, retention, practice, and material effects in learning. Theories of learning, and results of research in learning. Relationship of theories to methodology and curricular practices. Prerequisite: Education 102 or 301.

533. (3) **Psychology of Handicapped Children.**—Physical, mental, social, and emotional characteristics of handicapped children (backward, crippled, hard-of-hearing, etc.). Prerequisite: Education 407 or 408.

535. (3) **Evaluation.**—Basic principles; tests and other instruments for measuring instruction. Prerequisite: Education 435 or equivalent.

536. (3) **Individual Tests.**—Administration, scoring, interpreting, and values of Revised Stanford Binet, Wechsler-Bellevue, etc.; nature of intelligence; constancy of the IQ, etc.

539. (3) **Educational Television.**—An extensive study of the theory, practice, and evaluation of educational television, based on research. Prerequisite: Education 414 or consent of staff. Limited to 20 students in any one session.

540. (3) **Research in Audio-Visual Education for Schools.**—Recent research on the effects of various types of audio-visual material on learners. Review of experimental work on techniques of using audio-visual media.

541. (3) **Theory and Principles of Art Education.**—History, theories, principles, methods and practices of art education. The place and contribution of art in total education. Prerequisite: a major in Art or equivalent.

542. (3) **Theory and Principles of Music Education.**—Supervision and administration of music education. Individual projects in special interest areas. Prerequisite: a major in Music Education or equivalent.

551. (3) **Foundations for Inquiry in Educational Administration.**

552. (3) **Basic Contributions to Administrative Thought.**

553. (3) **Seminar and Group Inquiry in Educational Administration.**

556. (1½) **Administration of the Educational Programme.**

557. (1½) **Administration of the Elementary School.**

558. (1½) **Administration of the Secondary School.**

559. (1½) **Educational Finance.**

560. (1½) **School Law.**

561. (3) **Laboratory Practicum.**—A study of individual children with educational problems. Prerequisite: Preparation in measurement, diagnosis and remedial treatment. Admission by consent of instructor.

562. (1½) **Curriculum Organization in the Elementary School.**—History and development of elementary curricula; principles of organization, administration, and evaluation; unit, course, and programme design.

563. (1½) **Curriculum Organization in the Secondary School.**—History and development of secondary curricula; principles of organization and adaptation; articulation of secondary with higher education programmes.

564. (3) **Research Problems in Curriculum Organization.**—Theories of curriculum organization and a review of recent research. The work of the curriculum director. Prerequisite: Education 204 or 404.

565. (3) **Special Course in Subject Matter field.**—Courses in various subject matter fields designed to bring teachers up to date in new advances and recent findings in each field. See also Physics 430 (Recent Developments in Physics).

566. (3) **Principles of Secondary Education.**—Recent thought on classroom procedures, provisions for individual differences, discipline. The place of various school subjects in total education, and remedial education in Canada and other countries.

567. (3) **Principles of Elementary Education.**—Recent thought on classroom procedures, provisions for individual differences, discipline. The place of various school subjects in total education, and remedial education in Canada and other countries.

568. (3) **Special Education of the Orthopaedically and Neurologically Handicapped.**—For specialists in the education of the crippled, hospitalized, spastic, etc. Recent research in methods of instruction. Prerequisite: Education 407.

569. (3) **The Regional, Junior or Community College.**—History and philosophy of the junior college. Studies of the theoretical bases for its establishment, organization, finance, personnel and curriculum.

570. (3) **Advanced Seminar in Educational Sociology.**—Development of social theory; contemporary systematic positions and their relation to modern educational theory. Culture. Social motivation. Social problems of administration and control. Prerequisite: Education 470 or consent of instructor.

571. (3) **Advanced Seminar in Educational Psychology.**—Advanced study of research and problems in learning, mental hygiene, measurement. Prerequisite: Education 530 or approved Senior Course.

572. (3) **Advanced Seminar in Curriculum Organization.**—Presentation and discussion of current theories and practices in curriculum organization and administration. Prerequisite: Education 562-63/or Education 564.

573. (3) **Advanced Seminar on Exceptional Children.**—Review of research related to diagnostic and remedial techniques in Special Education, and application of these techniques in field experience. Prerequisite: Education 533.

574. (3) **Supervision of Reading.**—Curriculum analysis and planning. Implications for the administrator, the consultant and supervisor of reading. Prerequisite: Consent of instructor.

575. (3) **Educational Classics and Their Authors.**—The educational writings of such educational theorists as Plato, Aristotle, Quintilian, Castiglione, Luther, Erasmus, Ignatius of Loyola, Elyot, Bacon, Comenius, Milton, Locke, Rousseau, Pestalozzi, Herbart, Froebel, Spencer, James, Dewey.

576. (3) **Advanced Seminar in the Supervision of Instruction.**—For Superintendents, Principals, Directors of Education and other Supervisory Personnel desiring advanced study in this area. Prerequisite: Consent of Division.

577. (3) **The Educational Philosophy of John Dewey.**—Philosophic presuppositions of Dewey's educational thought; readings in Plato, Hegel, Charles Peirce, Herbert Mead, and William James. Analysis and discussion of *Democracy and Education*, *Experience and Education* and *Art as Experience*. Prerequisite: 9 units of Philosophy or consent of the instructor.

578. (3) **Advanced Seminar in Theories of Guidance and Counselling.**—Theory, research, techniques and ethical practices in counselling. Prerequisite: Education 411. Students are also advised to take Education 332 and 535.

579. (3) **Research on Guidance Services.**—Present resources and services together with techniques of assessing and using available material. Workshop in character requiring experimental investigations.

580. (3) **Problems in Education.**—Investigation and report of a problem.

581. (1½) **Methods of Educational Research.**—Scientific method in education; discovering problems; types of research; standards in thesis writing; critical study of published research.

582. (1½) **Statistics in Educational Research I.**—Inferential statistics including sampling theory and the testing of hypotheses as applied to educational research. Prerequisite: Education 482 or consent of instructor.

583. (3) **Advanced Seminar in Adult Education.**—Discussion of various projects in research or organization carried out by students. Prerequisite: Education 514 or 515 or 518.

584. (3) **Statistics in Educational Research II.**—Advanced statistical techniques including non-parametric statistics, factor analysis and other related topics. Prerequisite: Education 582.

585. (3) **Advanced Seminar on Research in Pre-School Education.**—Educational procedures and materials found through research to meet best the physiological, social and psychological needs of young children. Prerequisites: Education 331 and 333.

599. (3) **Master's Thesis.**

601. (3-6) **Doctoral Seminar.**

699. **Doctoral Dissertation.**

UNIVERSITY SUMMER SESSION

The announcement of the courses to be offered in the summer session (approximately seven weeks in length) will be issued in March, and will be available on request from the Registrar.

The regulations, etc., governing the summer session are as follows:

1. The maximum credit for summer session work in any one calendar year is 6 units. Correspondence courses may not be taken concurrently.

2. Students are required to register on or before May 10, after which date a penalty will be exacted. No student will be permitted to register after June 1.

3. Restriction on registration in the Summer Session:

(a) A student who obtained *Fail* standing during the last Winter Session attended *may not* enrol in Summer Session.

(b) A student in attendance at a secondary school during the previous winter *may not* enrol in the Summer Session.

(c) Any student who applies for admission to the Summer Session *after June 1* will not be admitted.

(d) The University reserves the right to reject applicants for the Summer Session whose previous academic records are unsatisfactory, even if they technically meet entrance requirements.

(e) Unless students have or are eligible for a teacher's certificate they may not take professional Education courses at Summer Session.

CORRESPONDENCE COURSES FOR ACADEMIC CREDIT

University credit may be obtained in a number of fields by correspondence courses offered through the Department of University Extension. Although University regulations preclude a student from taking a full degree programme by this means, these courses will be valuable to teachers wishing to improve their qualifications during their teaching year, to persons who have had to interrupt their regular university attendance, or even to graduate students of this or other universities who may wish to take certain prerequisites in other fields of study. A Correspondence Course Syllabus is available from the Department of University Extension or from the Office of the Registrar.

Admission. Correspondence courses are open to applicants with full First Year or Grade 13 standing, or to holders of a teacher's certificate. Students registered in the winter session of the University are not allowed to enrol in correspondence courses concurrently with winter session work or during the summer between successive winter sessions.

Registration. Applications for correspondence courses should be directed to the Office of the Registrar. Only one correspondence course may be taken at a time. Correspondence courses may not be taken concurrently with any other course work of the University. All courses must be completed within the time specified.

Certain courses (marked with an asterisk in the list of course offerings below) now run concurrently with the academic year. Registration in these must be completed before the beginning of the winter session in September. Registration for all other courses may take place at any time throughout the year.

Credit. Full degree credit is granted for correspondence courses. However, the maximum number of units of credit which may be taken by correspondence courses towards a degree is 15 units. The University will not grant credit for correspondence courses taken concurrently from another university. *Fees.* Fees for a correspondence course are \$100.00 (subject to change without notice).

Examinations. Final examinations in correspondence courses may be written in April, August or December. Students who have successfully completed all course papers and assignments must notify the Office of the Registrar of the date and centre selected for their final examination. The Registrar of the University will endeavour to arrange the supervision of the examination at the centre selected by the student or an alternative centre conveniently located.

Standards in the final examinations will be the same as those for resident students. Students who fail in two final examinations in any one course will not be permitted to register again for that course.

Course Offerings

*Commerce 151, Fundamentals of Accounting; Economics 306, Labour Economics and Industrial Relations; Education 412, Introduction to Adult Education; English 200, A Survey of English Literature; *English 303 (formerly 300), English Composition (for students in the Faculty of Education only); English 321, Approaches to Poetry; English 392 (formerly 431), Victorian Poetry; *French 210, Second Year University French; *German 200, Second Year German; History 212, History of the United States of America; *History 413, The Reformation; Philosophy 100, Introduction to Philosophy; Political Science 200, Democratic Government and Politics; Psychology 100, Introductory Psychology; Psychology 301, Developmental Psychology.

Certain courses are open to a limited number of students who do not wish to take them for credit. *Non-credit students should register through the Extra-sessional Division of the Department of University Extension.* In all these courses the instructor rules on any non-credit student's eligibility to enter and to remain in the course. Students will be expected to maintain the same schedule of readings and written assignments as the regular students but will not need to write the final examination.

Note: For non-credit diploma courses in the Faculty of Commerce and Business Administration, see the calendar for that faculty.

EXTRA-SESSIONAL CLASSES

1. Extra-sessional classes in the evenings or late afternoons may be taken for credit, in certain subjects, by students proceeding to the B.Ed. degree who are at least 18 years of age, are eligible for registration at least as Second Year students (full undergraduate or conditioned) and who have the pre-requisite standing. Certain courses for students qualified to proceed to the M.A. (in Education), or M.Ed. degree may also be available on campus.

2. Students attending the extra-sessional classes will normally be tested by the ordinary winter session examinations. Credit will be given for the course if a grade of at least 50% is obtained.

3. Correspondence and off-campus extra-sessional courses may be offered as prerequisites, but they are not acceptable for credit on a Master's programme.

**THE SCHOOL
OF
PHYSICAL EDUCATION
AND
RECREATION**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The School of Physical Education and Recreation calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

- ROBERT F. OSBORNE, B.A., B.Ed. (Brit. Col.), Professor and Director of the School.
- H. DOUGLAS WHITTLE, B.P.H.E. (Toronto), M.S., Ph.D. (Oregon), Professor.
- STANLEY R. BROWN, Diploma of Phys. Ed. (Otago), M.S., Ph.D. (Illinois), Associate Professor.
- A. B. LAITHWAITE, C.D., Dip. in Phys. Ed. (Carnegie Phys. Tr. Coll.), M.S. (Oregon), Associate Professor.
- PETER M. MULLINS, Dip. in Phys. Ed. (Sydney Teachers' College), M.S., Ed.D. (Washington State), Associate Professor.
- MRS. H. E. PENNEY, B.A. (Toronto), A.M. (Texas State College for Women), Associate Professor.
- JACK B. POMFRET, B.A. (Health and P.E.), M.S. (Washington), Associate Professor.
- M. ROSS HETHERINGTON, B.P.E. (Alberta), M.S. (Oregon), B.Ed. (Alberta), Assistant Professor.
- ROBERT G. HINDMARCH, B.P.E. (Brit. Col.), M.S., Ed.D. (Oregon), Assistant Professor.
- ERIC W. BANISTER, B.Sc. (Manchester), Dip. in Phys. Ed. (Loughborough Coll.), M.P.E. (Brit. Col.), Ph.D. (Illinois), Assistant Professor.
- D. LIONEL PUGH, B.A., Dip. in Educ. (Wales), Dip. in Phys. Ed. (Carnegie Phys. Tr. Coll.), Assistant Professor.
- RICHARD L. RAMSAY, B.S. (Sir George Williams), M.A., Ed.D. (Columbia), Assistant Professor.
- MISS BARBARA SCHRODT, B.P.E. (Brit. Col.), M.S. (Oregon), Assistant Professor.
- MISS ANNE D. TILLEY, Dip. Dartford College of Physical Education, B.A. (McMaster), Assistant Professor.
- FRANK T. GNUP, B.S.(P.E.) (Manhattan College), Senior Instructor.
- R. J. PHILLIPS, Senior Instructor and Athletic Director.
- ERIC F. BROOM, Dip. in Phys. Ed. (Loughborough Coll.), Instructor.
- JOSEPH R. JOHNSON, B.P.E., M.P.E. (Brit. Col.), Assistant Professor.
- MISS BONNIE PHILLIPS, B.A. (P.E.) (Sask.), M.Sc. (Purdue), Instructor.
- MISS MARILYN RUSSELL, B.P.E. (Brit. Col.), Instructor.
- BRIAN J. WIGHTMAN, Dip. in Phys. Ed. (Loughborough Coll.), M.S. (Wisconsin), Instructor.
- GRANT VINCENT, Dip. Imperial Soc. of Teachers of Dancing (London), Lecturer.
- PAUL A. WILLEY, B.A. (Sacramento State), Lecturer.
- FRANK READ, Honorary Lecturer.

Jointly with the Faculty of Education:

- LORNE E. BROWN, B.P.E., M.A. (Oregon), Associate Professor.
- MISS KATHLEEN L. MEREDITH, B.A. (Western Ont.), Assistant Professor.

J. R. MITCHELL, B.P.E., B.Ed. (Brit. Col.), M.S. (Ore.), Assistant Professor.

MISS SHIRLEY NALEVYKIN, B.A. (Sask.), B.Sc. (McGill), M.S. (Michigan),
Assistant Professor.

GARY PENNINGTON, B.A. (Seattle), M.S. (Wash.), Assistant Professor.

NORMAN S. WATT, B.P.E. (Brit. Col.), M.S., Ed.D. (Oregon), Assistant Pro-
fessor.

MISS EVE WISEMAN, Instructor.

1966-67

THE SCHOOL OF PHYSICAL EDUCATION AND RECREATION

The School of Physical Education and Recreation is responsible for (1) the voluntary physical education activities of all students, (2) the intramural sports programme, (3) the courses leading to the degrees of Bachelor and Master of Physical Education, and (4) the physical education programme for students majoring in Physical Education in the Faculty of Education.

Course Leading to the Degree of B.P.E.

The B.P.E. degree (the hood is malachite green) will be awarded on the completion of a minimum of 69 units of approved course work as indicated hereunder following Secondary School Graduation (University Programme).

Students in all years are normally subject to the same regulations as those in the B.Ed. (secondary field) course. Supplemental examinations will not be granted in Physical Education Activity Courses. Students who are unable to meet the requirements because of medical or other approved reasons may, at the discretion of the School and with the approval of the Dean, be granted deferred examinations. Such privilege will be considered only if the student submits a written application to the Director before the end of the official examination period. When the privilege of supplemental or deferred examinations has been granted, students must complete requirements prior to attendance at the next regular session. The School may require that additional work be undertaken in summer school.

Two different programmes are available:

- (a) The programme for specialization in Physical Education.
- (b) The programme for specialization in Recreation.

All students on Programme (a) must elect a second major consisting of a minimum of 9 units of course work normally offered in the Third and Fourth years of the Faculty of Arts or the Faculty of Science. Students intending to enroll in the Faculty of Education for the one-year programme for university graduates, should choose their courses so as to satisfy the requirements for admission to that programme. (See *Faculty of Education calendar*).

A physical education project is required of all students on Programme (a). The topic must be approved by the Director before the end of the Third Year's work. One typewritten copy of the project must be submitted on standard-sized paper not later than February 15 of the graduation year.

Medical Examination

Students enrolling for the B.P.E. degree or the B.Ed. degree with a major in Physical Education are required to have a medical examination conducted by the University Health Service at the time of first registration for Activity Courses in Physical Education.

This examination is provided by the Health Service. Appointments must be made during the registration period. The examination must be completed within the first two weeks of the Session.

For subsequent years students are advised and encouraged to consult the Health Service concerning any health problems.

N.B. Students who fail to meet these requirements will be refused admission to classes, and will have to assume responsibility for obtaining a medical certificate at their own expense.

Course Leading to the Degree of M.P.E.

Prerequisites: Bachelor's degree equivalent to the B.P.E. of the University of British Columbia with standing as indicated in the Admission Requirements for the Master's degree (see the Faculty of Graduate Studies calendar), and in Physical Education 470 (Tests and Measurements) or an equivalent course.

M.P.E. Course: a total of 18 units, including a thesis (counting from 3 to 6 units), required advanced courses in Education and Physical Education, and courses in other departments. Details of the required advanced courses will be available from the Director of Physical Education and Recreation.

Course Leading to the Degree of M.Ed.

Students holding a B.Ed. degree, with a major in Physical Education, who have been accepted for the M.Ed. degree, may with the approval of the Graduate Division of the Faculty of Education, enroll for a programme of advanced studies in Physical Education. (See the *Faculty of Graduate Studies calendar*).

Unsatisfactory Standing

(a) A student who passes in fewer than six units (two courses) in the first year of University following Grade 12 will not be permitted to re-enrol at University to repeat the studies of that year. Consideration will be given to re-admitting a student in this category following his satisfactory completion of Grade 13 or its equivalent. A student who passes six units, while not receiving credit in the year, may re-enrol on probation to repeat his studies but during the subsequent session may be required to withdraw at any time for unsatisfactory progress.

(b) A student in the First Year who obtains credit for only nine units on a full programme will be re-admitted on probation but during the subsequent session may be required at any time to withdraw for unsatisfactory progress.

(c) A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to withdraw from the University; he may be re-admitted after a period of at least one year if his appeal to Senate is supported by the Committee on Admissions of the Faculty concerned and upheld by Senate.

Fees—*Subject to change without notice*

First Term Fees, \$243 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$457 at time of registration. Fourth Year students will be charged an additional \$7 to cover the graduating fee.

Second Term Fees, \$214, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations.

Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's Office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplemental Examinations

Supplemental examinations may be written in August at the following centres: Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.00.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

PROGRAMME FOR SPECIALIZATION IN PHYSICAL EDUCATION

First Year	Units
English 100 (Literature and Composition)	3
Chemistry 101 or 102 or 110	3
Mathematics 110 or 120	3
Electives (to be chosen in consultation with the School of Physical Education and Recreation)	6
Physical Education Activities	2

Notes:

1. Chemistry 91 is recommended for entrance.
2. Students entering the course from Grade 13 or from First Year Arts or Science may take Physical Education activities totalling 5 units.
3. Biology 101 or Zoology 105 and Psychology 100 may be taken in First Year. If taken in First Year they may be replaced by optional courses in Second Year.
4. Chemistry 101 or 102 or 110 may be taken in Second Year provided Biology 101 or Zoology 105 or Psychology 100 is taken in First Year.

Second Year	Units
English 200	3
Biology 101 or Zoology 105	3
Psychology 100	3
Elective (to be chosen in consultation with the School of Physical Education and Recreation)	3
Physical Education 260	1½
Physical Education Activities	3

Third Year	Units
Physical Education 360	1½
Physical Education 361	1½
Anatomy 390	3
Zoology 303	3
Elective	3
Physical Education Activities	5
Physical Education 455	0

Fourth Year	Units
Physical Education 460	1½
Physical Education 461	1½
Physical Education 462	1½
Electives	9
*Physical Education Activities	3½ to 5
Physical Education 455	0

*May consist of 3½ or 5 units. Students who do not take 5 units of Physical Education activities courses must take an additional 1½ units of optional theory courses.

Activity Programme for Men and Women

Courses must be selected to satisfy the following requirements in consultation with the faculty advisor.

	Men	Women
Area 1: Gymnastics.....	2 units	2 units
Area 2: Games.....	6 units	6 units
Area 3: Swimming.....	½ unit	½ unit
Area 4: Dance.....	1½ units	3 units
Optional*.....	5 units	3½ units
	<hr/>	<hr/>
	15 units	15 units

**REQUIREMENTS FOR A MAJOR IN PHYSICAL EDUCATION FOR
STUDENTS ENROLLED FOR THE BACHELOR OF
EDUCATION DEGREE**

Activity Courses—9 units.

Theory Courses—6 units as follows:

- P.E. 262 (1½);
either P.E. 260 (1½) or P.E. 360 (1½);
2 of P.E. 361 (1½),
P.E. 460 (1½), P.E. 462 (1½),
P.E. 470 (1½).

**ACTIVITY PROGRAMME FOR PHYSICAL EDUCATION MAJORS
WITHIN THE DEGREE OF BACHELOR OF EDUCATION**

Courses must be selected to satisfy the following requirements in consultation with the faculty advisor.

	Men	Women
Area 1: Gymnastics.....	2 units	2 units
Area 2: Games.....	4 units	3 units
Area 3: Swimming.....	½ unit	½ unit
Area 4: Dance.....	1 unit	2 units
Optional.....	1½ units	1½ units
	<hr/>	<hr/>
	9 units	9 units

Note:

1. Students who can demonstrate satisfactory standards in swimming may select an optional course in lieu of P.E. 230, provided written permission has been obtained from the Director of the School of Physical Education and Recreation.

2. Students in the Secondary Programme may include additional courses in Physical Education as electives with the approval of the Director of Secondary Education.

PROGRAMME FOR SPECIALIZATION IN
RECREATION

First Year	Units
English 100 (Literature and Composition)	3
Psychology 100	3
Biology 101 or Zoology 105	3
Physical Education Activities	2
*Electives	6
Second Year	Units
English 200	3
Fine Arts 125 or 126	3
Physical Education 360	1½
Physical Education 262	1½
Physical Education Activities	3
Psychology 206	3
*Elective	3
Third and Fourth Years	Units
Education 412	3
Education 205	1
Music 326	3
Physical Education 460	1½
Recreation 490	1½
Recreation 492	1½
Recreation 494	1½
Recreation 495	1½
Recreation 496	1½
Architecture 425	3
Two of: Social Work 502 and 503, Sociology 301 or 425, Psychology 301, 308, Planning 501, 502, 521	6
Physical Education Activities or a programme including Drama or Art or Music as approved by the Director	3
Electives	6

Notes:

1. Students are advised to include Commerce 151 (Fundamentals of Accounting) in their optional courses.
2. Normally students should register for Recreation 495 in the Third Year, and Recreation 496 in the Fourth Year.
3. Courses in Social Work and Community Planning may be included in the elective programme with the approval of the Director of the School of Social Work and/or the Professor of Planning.

*Electives must be chosen from the following:

Foreign Language, Mathematics, Chemistry, Sociology 200, Commerce 151, Drama or Art or Music, or others with the written approval of the Director.

4. Physical Education 230 must be included in the physical education activity courses, unless written permission to substitute another course has been obtained from the Director.
5. Recreation students may select any Physical Education activity course to satisfy the requirements with the approval of the Faculty Advisor.

UNIFORMS

All students enrolling for Physical Education Activity Courses must obtain the following required standard uniforms or personal items at the University Bookstore at time of registration.

FIRST AND SECOND YEARS

MEN	WOMEN
Shorts and "T" Shirts	Shorts and blouse
Track suit	Track suit and leotard
Shoes for activity courses	Low white tennis shoes

THIRD AND FOURTH YEARS

MEN	WOMEN
Long Trousers and "T" Shirt	Teaching tunic
White tennis shoes or Gymnastic slippers	

ACTIVITY COURSES

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 101 (1) under Physical Education indicates that Physical Education 101 is a one-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms.	[2-3; 2-3]
1 lecture and 2 hours laboratory per week, first term.	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term.	[0-0; 1-2]
2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms.	[2-3-2; 2-3-2]

AREA 1: GYMNASTICS

101. (1) **Gymnastics I.**—A first course in gymnastics. [0-2; 0-2]
201. (1) **Gymnastics II.**—A second course in gymnastics including theory of gymnastics. Prerequisite: P.E. 101. [0-2; 0-2]
204. (½) **Olympic Gymnastics.**—Introduction to Olympic Gymnastics. Prerequisite: P.E. 101, or the permission of the Instructor. [0-0; 0-2]
301. (1) **Gymnastics III.**—An advanced course in gymnastics. Teaching methods and technique, demonstration materials, tumbling, vaulting and apparatus activities. Prerequisite: P.E. 201. [0-2; 0-0]
303. (1) **Olympic Gymnastics.**—An advanced course in apparatus work. Prerequisite: P.E. 204. [0-0; 0-2]
- ‡401. (1) **Gymnastics coaching.**

AREA 2: GAMES

206. (½) **Lacrosse.**—Fundamental skills, drills, rules, defensive and offensive tactics. [0-2; 0-0]
208. (½) **Baseball.**—Fundamentals, rules of baseball and softball. [0-0; 0-2]

209. (½) Softball.—Fundamentals and rules. [0-0; 0-2]
210. (½) Basketball.—Fundamentals, basic drills, simple offensive tactics. [0-2; 0-0]
211. (½) Ice Hockey.—Theory, basic skills, teaching and coaching of hockey. [0-0; 0-2]
212. (½) Football.—Fundamentals, basic drills and formations. [0-2; 0-0]
213. (½) Field Hockey.—Fundamentals, basic drills, rules. [0-2; 0-0]
214. (½) Rugby.—Basic skills, laws, elementary teaching techniques. [0-0; 0-2]
215. (½) Soccer and Speedball for Women.—Fundamentals, basic drills, rules, and team play. [0-0; 0-2]
216. (½) Soccer.—Basic skills, rules, emphasis on playing. [0-2; 0-0]
217. (½) Social Recreation.—Programme planning and leadership techniques in social recreation including mixers, party games, and special holiday programmes for all ages. [0-0; 0-2]
218. (½) Games, Contests and Relays.—Relay, group and recreational games and activities. [0-0; 0-2]
219. (½) Volleyball.—Basic skills, rules, team tactics. [0-2; 0-0]
220. (½) Badminton.—Strokes, tactics, systems, rules. [0-0; 0-2]
221. (½) Archery.—Techniques, competitions, care of equipment. [0-0; 0-2]
223. (½) Wrestling.—Basic techniques and skills, rules. [0-0; 0-2]
224. (½) Golf.—Theory of swing, practical application, etiquette, and rules. [0-2; 0-0]
225. (½) Bowling.—Fundamentals; principles of instruction; organization and administration of leagues and tournaments. [0-2; 0-0]
226. (½) Tennis.—Strokes, tactics, systems, umpiring. [0-0; 0-2]
229. (½) Weight Training.—Principles of progressive resistance exercise and its application to specific and general programmes of conditioning. Prerequisite: Physical Education 262 or Anatomy 390, which may be taken concurrently. [0-0; 0-2]
248. (½) Skiing.—Fundamentals; principles of teaching and coaching; equipment; conduct of tournaments. [1-1; 0-0]
250. (½) Track and Field I.—Elementary teaching techniques, training, tactics where applicable, current standards and rules of the following events: Sprinting (100 yards, 220 yards and 440 yards), Sprint Relays, High Jump, Long Jump, Triple Jump, Hurdling (80 metres) and High Hurdles (men). [0-2; 0-0]
251. (½) Track and Field II.—Elementary teaching techniques, training, tactics where applicable, current standards and rules of the following events: Middle Distance Running, Hurdling (220 Low Hurdles, 440 yard Hurdles), Pole Vault, Shot, Discus, Javelin, Relays. [0-0; 0-2]
310. (1) Basketball II.—Team tactics; rules; coaching and officiating techniques; use and development of material. Prerequisite: Physical Education 210. [0-0; 1-1]
312. (1) Football II.—Offensive and defensive tactics; generalship; conduct of practices; use and development of material; rules; coaching. Prerequisite: Physical Education 212. [0-0; 1-1]
313. (1) Field Hockey II.—Team tactics; coaching and officiating techniques. Prerequisite: Physical Education 213. [0-0; 1-1]

314. (1) Rugby II.—Team tactics; organization, coaching methods, laws, refereeing. Prerequisite: Physical Education 214. [1-1; 0-0]
316. (1) Soccer II.—Team tactics; organization, coaching methods; rules, refereeing. Prerequisite: Physical Education 216. [0-0; 1-1]
319. (1) Volleyball II.—Offensive and defensive tactics, coaching and officiating techniques. Prerequisite: P.E. 219. [0-0; 0-2]
323. (1) Wrestling II.—Advanced skills and techniques, officiating, refereeing, and organization and administration of competition. Prerequisite: P.E. 223. [0-0; 0-2]
350. (1) Track and Field III.—Organization and conduct of Track and Field and Cross-Country Meets. Promotion with particular reference to the function of officials. Advanced coaching techniques in selected events together with a study of training and conditioning for the individual athlete. Schedule compilation. Prerequisite: P.E. 250 or 251. [0-0; 2-0]
- ‡410. (1) Basketball Coaching.
- ‡412. (1) Football Coaching.
- ‡413. (1) Field Hockey Coaching.
- ‡414. (1) Rugby Coaching.
- ‡416. (1) Soccer Coaching.
- ‡450. (1) Track and Field Coaching.

AREA 3: SWIMMING

230. (½) Swimming.—Elementary swimming skills, strokes, entries, water safety, Red Cross Senior Certificate. [0-3; 0-0]
330. (1) Swimming.—Life-saving; advanced swimming; Red Cross Instructor's Certificate; teaching practice. Prerequisite: Physical Education 230 (Test A), or consent of Instructor. [0-3; 0-0]
332. (1) Aquatic Programmes.—Competitive swimming, coaching, training and conditioning; care of facilities; conduct of swimming galas and pageants; safety procedures. Prerequisite: Physical Education 330 or consent of Instructor. [2-0; 0-0]
- ‡ 430. (1) Swimming Coaching.

AREA 4: DANCE

141. (½) Dance.—Analysis of rhythm and movement. [0-2; 0-0]
240. (½) Ballroom Dance I.—Basic figures and techniques of Waltz, Foxtrot and Rhumba. [0-2; 0-0]
241. (1) Modern Dance.—Dance techniques, improvisations and elementary dance composition. Survey of the cultural history of the dance. Prerequisite: P.E. 141. [0-2; 0-2]
242. (½) Ballroom Dance II.—Standard variations added to dances from course P.E. 240, plus basic figures and techniques of Samba and Argentine Tango. Prerequisite: Physical Education 240. [0-0; 0-2]
243. (½) Square Dance.—Square and couple dances. [0-0; 0-2]
244. (½) National Dance.—A practical study of the basic steps, dances and

Coaching Courses

N.B. ‡Permission to register for courses marked with ‡ will be considered by the Director upon receipt of a written application by the student following completion of two courses in the sport concerned. Such application should be submitted prior to Labour Day. Normally, permission will be granted only if the student has achieved First Class standing in the preceding course and has had some previous coaching experience. Registration will be limited.

style characteristics of the folk dance of various countries. [0-0; 0-2]

245. (1) **Dance Styles.**—More detailed and advanced study of selected dance styles. Prerequisite P.E. 244. [0-2; 0-2]

340. (1) **Ballroom Dance III.**—Advanced variations added to dances from courses P.E. 240 and P.E. 242, plus International Tango and combination of both tangos, and advanced technical approach to methods used in teaching social dancing of Bronze Pin standards. Prerequisite: Physical Education 240 and 242. [0-2; 0-0]

343. (1) **Square Dance II.**—Presentation of advanced square and couple dances—calling. Prerequisite: P.E. 243. [0-2; 0-0]

441. (1) **Dance Composition.**—Advanced dance composition group and stage production. [1-1; 1-1]

Note: It is recommended that men students have experience in at least two areas of dance activity and that women students have experience in three areas.

AREA 5: FIELD WORK

† 455. **Approved Field Work or Supervised Teaching.**—To be taken in Third or Fourth Year as a requirement for graduation but without unit value.

THEORY COURSES

Note: Zoology 303, Anatomy 390, and Home Economics 310 are considered theory courses for the B.P.E. degree.

260. (1½) **Principles of Physical Education.**—A study of fundamental principles, aims, objectives to formulate the student's professional point of view; a study of competition, its history, basic principles, and its place in education. [3-0; 0-0]

†262. (1½) **Health I.**—An introduction to health education; body systems, growth and development, food habits and problems, personal hygiene. Prerequisite: Second Year standing or consent of Instructor. [0-0; 3-0]

360. (1½) **History of Physical Education and Recreation.**—A survey of physical education and recreation from the ancient civilizations, with emphasis placed on present day developments and methods. Prerequisite: Third Year standing or consent of Instructor. [3-0; 0-0]

361. (1½) **Prevention and Care of Injuries.**—Prerequisite: Third Year standing or consent of Instructor. [2-2; 0-0]

362. (1½) **Adapted Physical Education.**—A study of the problems related to the physically handicapped. Low Fitness, Body Mechanics, Nutritional Disturbances and other handicaps. [0-0; 2-2]

†406. (1½) **Workshop in Physical Education.**—Curriculum construction with emphasis on unit and lesson planning and teaching methods.

†408. (1½) **Workshop in Physical Education Activities.**—An advanced course covering a number of physical education activities.

460. (1½) **Organization and Administration of Physical Education.**—A study of the problems relating to the organization and administration of physical education programmes. Prerequisite: P.E. 260 or 360, and Fourth Year standing. [0-0; 3-0]

461. (1½) **Physical Education Project.**—See page M9. An oral report of the project must be made to the seminar. [1-0; 1-0]

462. (1½) **Health II.**—Problems in health education; mental hygiene,

† These courses may be taken for the B.P.E. degree only with the written approval of the Director.

common diseases, social hygiene, community health and sanitation. Prerequisite: Zoology 303 or Anatomy 390 or Physical Education 262. [3-0; 0-0]

470. (1½) **Tests and Measurements.**—Physical education tests; physical fitness, physiological fitness, posture, strength, motor ability, social efficiency measures, skill tests, knowledge tests. [0-0; 2-2]

RECREATION THEORY COURSES

490. (1½) **Recreation.**—An introduction to the background and principles of community recreation; the relationship of school programmes to community programmes; the philosophy and principles of recreation. [3-0; 0-0]

492. (1½) **Recreation Administration.**—A study of the legal, financial and organizational aspects of public recreation, with special attention to planning, public relations, and the organization of community resources. [0-0; 3-0]

494. (1½) **Outdoor Recreation.**—A study of outdoor areas, such as playgrounds, parks and camps, and the relationship of phenomena of nature; camp craft and programme skills; climbing and hiking and related activities; principles of safety and survival in mountainous and wilderness areas. [3-0; 0-0]

495. (1½) **Field Work I.**—Planned observation and supervised practice work in a variety of appropriate institutions and agencies. Normally this course will extend throughout the whole of the Third Year.

496. (1½) **Field Work II.**—Assigned field work; study of the principles and practice of supervision. Prerequisite: Recreation 495.

GRADUATE COURSES

500. (1-3) **Graduate Seminar.**

530. (1-3) **Directed Studies.**

563. (1½) **Physical Fitness Seminar.**—Elements of fitness; physical fitness testing; bodily changes prior to, during and following exercise.

565. (1½) **Analysis of Physical Activity.**—A review of techniques used in evaluating physical performance with special reference to the inter-disciplinary nature of such work.

570. (1½) **Review of Research in Physical Education.**—Historical, philosophical; anthropometric and body mechanics; kinesiological research in the mechanics of sports and physical education activities; related physiological and psychological research.

571. (1½) **Physical Rehabilitation Laboratory.**—The theory and practice of physical rehabilitation and its relation to physical education; practical experience in handling rehabilitation cases; work will be assigned at Riverview Hospital, Essondale; G. F. Strong Rehabilitation Centre; Workmen's Compensation Board; or at the Vancouver General Hospital.

580. (1½) **Current Problems in Physical Education.**—Objectives; programmes; leadership; history and trends; professional status; community organizations and auspices.

583. (1½) **Physical Education Programmes.**—The development of curricula in physical education; relationships of programmes in schools, community centres and other institutions.

584. (1½) **Motor Skills and Physical Efficiency of Young Children.**—Survey of the literature in child development with special emphasis on physical growth and skill acquisition. Development of limited research projects by individual students and presentation of a seminar report on one research aspect of child development.

599. (3-6) **Master's Thesis.**

**THE FACULTY
OF
FORESTRY**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Forestry calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. In general, *application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

- JOSEPH A. F. GARDNER, M.A. (Brit. Col.), Ph.D. (McGill), F.C.I.C., Professor and Dean of the Faculty.
- JOHN E. BIER, B.Sc.F., M.A., Ph.D. (Toronto), Professor.
- RAYMOND E. FOSTER, B.A., B.S.F. (Brit. Col.), Ph.D. (Toronto), Professor (Part time).
- KENNETH GRAHAM, B.A. (Brit. Col.), M.Sc. (McGill), Ph.D. (Toronto), Professor.
- BRAHAM G. GRIFFITH, M.A. (Brit. Col.), M.F. (Harvard), Ph.D. (Washington), Professor.
- PHILIP G. HADDOCK, B.S., Ph.D. (Calif.), Associate Professor.
- J. HARRY G. SMITH, B.S.F. (Brit. Col.), M.F., Ph.D. (Yale), Professor.
- ROBERT W. WELLWOOD, B.A.Sc. (Brit. Col.), M.F., Ph.D. (Duke), Professor.
- JACK W. WILSON, M.S., Ph.D. (State Univ. of New York), Associate Professor.
- LASZLO ADAMOVICH, Dipl. For. Eng. (Sopron), M.F. (Brit. Col.), Assistant Professor.
- ANTAL KOZAK, M.F., Ph.D. (Brit. Col.), Assistant Professor.
- DONALD D. MUNRO, B.S.F. (Brit. Col.), M.S. (Oregon State), Assistant Professor.
- OSCAR SZIKLAI, Dipl. For. Eng. (Sopron), M.F., Ph.D. (Brit. Col.), Assistant Professor.
- LEONID VALG, M.F. (Brit. Col.), Assistant Professor.
- J. RUSSELL MILLS, B.S.F. (Wash.), Lecturer.
- F. MALCOLM KNAPP, B.S.F. (Syracuse), M.S.F. (Washington), Professor Emeritus of Forestry.
- ROBERT E. BREADON, B.S.F. (Brit. Col.), M.F. (Duke), Director of the University Forest.
- JOHN WALTERS, M.F. (Brit. Col.), Research Forester, University Forest.

FACULTY OF FORESTRY

Introduction

The Faculty is well situated to serve the needs for education of foresters in Western Canada. Productive forests of British Columbia cover about 135 million acres and contain many commercially valuable tree species. The forests of B. C. support a dynamic forest industry that generated about 900 million dollars of income in 1964. It is estimated that with good forest management and full utilization this production could at least be tripled. British Columbia forests also yield important crops of fish and game and forage for domestic livestock. They have a beneficial influence on water flow and provide many pleasant opportunities for wildland recreation.

There are many excellent opportunities in British Columbia for satisfying professional careers in all aspects of managing, harvesting, protecting and growing of forest crops and for manufacturing and selling forest products. About 60 per cent of the University of British Columbia graduates in forestry are employed in industry and approximately 80 per cent are employed in British Columbia. There are good opportunities also for employment in Alberta, Saskatchewan, Manitoba and other Canadian Provinces. Several firms of consultant foresters serving national and international markets have their headquarters in Vancouver. Many large companies producing forest products in this area, as well as forestry associations, have their head offices in Vancouver. The district headquarters of the B. C. Forest Service is situated in Vancouver.

Although a very large proportion of graduates in forestry remain in their profession, some have chosen to study for new careers in public-school teaching, law, and medicine. The B.S.F. degree is accepted as a basic requirement for many post-graduate programmes but transfer to other Faculties at the University of British Columbia and to other Faculties of Forestry in Canada usually causes a loss in time at the undergraduate level.

In-service training for forest rangers is offered by the B. C. Forest Service at Green Timbers near New Westminster. The British Columbia Institute of Technology offers sub-professional, two-year post-high school curricula in forestry and in forest products technology.

General

The degree of Bachelor of Science in Forestry (B.S.F.—the hood is brown with green cord) is granted on the completion of four years' work in the Faculty of Forestry.

For admission to Forestry, a student shall have completed the First Year in Arts or Science at the University of British Columbia, or Grade 13 (British Columbia), or the equivalent.

The courses in Forestry provide a strong, well-rounded professional forestry training and at the same time give the student, through his choice of options, an opportunity to supplement his knowledge of allied sciences as a background for further specialized education. This objective is attained by requiring the student to take during each academic year a basic core of essential subjects and other courses which are elective. The choice of the student's electives is governed by the particular phase of forestry in which he is interested. The electives have also been arranged so that a student wishing to proceed with graduate studies in a particular specialty may do so without the necessity of having to take, before commencing his graduate

programme, a number of prerequisite undergraduate courses. The main phases of technical forestry or allied fields are: *Forest Management, Forest Business Administration, Logging, Forest Products and Wood Technology, Silvics, Forest Pathology, Forest Entomology, and Wildlife Management.*

All options provide basic knowledge of arts and sciences and their application to forestry problems, and establish a sound foundation to help foresters meet rapidly changing circumstances.

The student at the beginning of his second year must elect one of the eight options offered. If at the end of the second or subsequent years the student wishes to change his option he can generally do so but must complete any prerequisites of the new option and make up any deficiencies before graduation. Transfers into Logging and Forest Products and Wood Technology options usually present some difficulties unless the student can offer Mathematics 155 or its equivalent.

Students from any option are eligible for registration in the Association of British Columbia Foresters after two years of suitable experience following graduation.

Between the spring and fall sessions the student is expected to engage in industrial or professional work affording practical experience not obtainable in the laboratory or field classes. Before a degree will be granted, a candidate is required to satisfy the Faculty that he has completed a suitable amount of practical work.

Students are required to attend a 10-day field course in forest surveying at the University Research Forest near Haney immediately following Labour Day, preceding the Second Year. The fee for this course is \$35.

Immediately preceding the last day of registration in the fall term all third year students must take a 6-day field trip into the Interior of the Province. They also must complete 21 field days of instruction at the University Research Forest following completion of the spring examination period. The fee for the 6-day field trip is \$40; the fee for the spring camp is \$75. In addition, short field trips are required from time to time throughout the Third and Fourth Years, and the student is responsible for expenses incurred.

Graduate Studies

Throughout Canada there are some excellent opportunities in research and teaching for students who have specialized appropriately in their post-graduate studies.

The following graduate degrees are offered through the Faculty of Graduate Studies:

- M.F. —in major branches of Forestry, including economics and finance, entomology, fire control, harvesting, management, mensuration, pathology, photogrammetry, products, silvics, silviculture, wildlife management, and wood and fibre anatomy and properties.
- M.A.Sc. —in Forest Engineering.
- Ph.D. —in fields concerned with the basic scientific or economic aspects of forestry and forest products.

Detailed information may be obtained from the calendar of the Faculty of Graduate Studies.

Admission

The general requirements for admission to the University are given in the General Information bulletin.

For admission to Forestry, a student shall have completed the First Year in Arts or Science at the University of British Columbia, or Grade 13 (British Columbia), or the equivalent.

Students who plan to enter Forestry should register for the following courses in First Year Arts or Science, or the equivalent in Grade 13:

Biology 101, Principles of Biology (or Physics 110, Mechanics, Electricity and Atomic Structure)

Chemistry 110, Principles of Chemistry, or 101, General Chemistry, or 102, General Chemistry

English 100 (Lit. and Comp.)

Mathematics 120, Fundamental Mathematics (or 101 or 120 from Grade 13)

One additional course

A student who does not have credit for either Biology 101 or Physics 110 may be admitted to First Year Forestry but must consult the Dean before registering.

Candidates who expect to complete the requisite entrance standing through University or Grade 13 (British Columbia) supplemental examinations, held in August or September, may apply for admission and their applications will be considered subject to the results of these examinations.

Students intending to enter Forestry are advised to present Chemistry 12, Mathematics 12, and Physics 12 for Secondary School Graduation (University Programme).

Transfer

Application for transfer of students from other universities or other faculties to the Faculty of Forestry will be given careful consideration. Courses offered by transfer students will be reviewed flexibly, in relation to the core programme and special requirements of the option of interest to the student, with the general objective of keeping time lost by transfer to a minimum.

Fees—*Subject to change without notice*

First Term Fees, \$282 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$535 at time of registration. Fourth Year students are assessed \$260 (total fees \$542) which includes the Graduating Class Fee of \$7.

Second Term Fees, \$253, are payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Examinations and Advancement

1. Examinations are held in December and April. December examinations will be held in all subjects of the First and Second Years and are obligatory for all students taking these subjects. December examinations in subjects of the Third and Fourth Years, excepting those subjects that are completed before Christmas, are optional with the departments concerned. Application for special consideration on account of illness or domestic affliction must be submitted to the Dean not later than 48 hours after the close of the examination period. For further information see below.

2. Candidates, in order to pass, must obtain at least 50 per cent in each

subject; in courses which comprise both lecture and laboratory work students will be required to pass in **both** the written examinations and laboratory work before standing in the subject will be granted. The grades are as follows: First Class, an average of 80 per cent or over; Second Class, 65 to 79 per cent; Pass, 50 to 64 per cent. In a subject in which a candidate has failed to obtain 50 per cent, the Faculty may, at its discretion, award a pass in that subject on the basis of a good aggregate standing. Such a pass will be entered on his record as an 'adjudicated pass'. (See pars. 12 and 13.)

3. If a student's general standing in the final examinations of any year is sufficiently high, the Faculty may grant him supplemental examinations in the subject or subjects in which he has failed. Notice will be sent to all students to whom such examinations have been granted.

A candidate who has been granted a supplemental examination may write it only twice. Permission to write a third time may be given only if the course is repeated or an equivalent course taken. Tutoring approved by the Dean may be accepted as an equivalent course.

4. Supplemental examinations will be held in August. For further information see below. Special examinations will not be granted except by special permission of the Faculty, and then only during the third week in October or the third week in January. This permission is granted only in exceptional circumstances, such as domestic affliction or certified illness.

5. No student with defective standing will be admitted to the Second Year.

6. No student may enter the Third or higher year with supplemental examinations still outstanding in respect of more than 4 units of the preceding year, or with any supplemental examination outstanding in respect of the work of an earlier year unless special permission to do so is granted by Faculty.

7. No student will be allowed to take any subject unless he has previously passed, or secured exemption, in all prerequisite subjects.

8. A student who is required to repeat his year will not be allowed to take any work in a higher year. A student repeating his year need not repeat the laboratory portion of certain courses provided he has obtained a standing in the laboratory work which is acceptable to the head of the department in which the course is given.

9. Any student repeating his year will not be admitted with any supplementals outstanding.

10. A student who fails a second time in his University studies will be required to withdraw from the University.

11. Any student whose academic record, as determined by the tests and examinations of the first term, is found to be unsatisfactory, may be required by the Faculty to discontinue attendance at the University for the remainder of the session. Such a student will not be re-admitted to the Faculty as long as any supplemental examinations are outstanding.

12. Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.

13. Honours graduate standing will be granted to those who obtain First Class in the Final Year and who have passed any one of the three preceding years with at least 50 per cent. in each subject and 75 per cent. on the whole.

14. A candidate who does not complete his studies for graduation in May following Fourth Year, will be required to register for all uncompleted subjects, including graduating thesis, in a subsequent session, summer or winter, and will be assessed the regular fees for these subjects.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments, may, on the recommendation of the Head of the Department, be excluded by the Dean of the Faculty from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University to the satisfaction of the Registrar, before being granted *Honourable Dismissal*, or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interest of the student and/or the University.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings are governed by the following regulations:

1. Any request for the re-reading of an answer paper other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading

may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplemental Examinations

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination, no refund will be made. However, if the candidate within 10 days of the scheduled time of the examination submits to the Registrar an explanation of the circumstances concerning his failure to write, a refund will be considered. A refund, if made, will be \$5.00 only.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free of charge, except

following graduation when the first three are free of charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Forestry (B.S.F.) Course

First Year

Subject	First Term		Second Term	
	Lect.	Lab.	Lect.	Lab.
Chem. 230 Organic Chemistry	3	3	3	3
English 150 Composition	2	....	2	....
For. 150 Dendrology	2	2	1	2
For. 151 Profession of Forestry	1	....	1	....
For. 161 Forest Surveying .....	....	....	2	2
Geog. 202 Introduction to Weather and Climate	2	2	2	2
M.E. 154 Mechanical Drawing .....	....	3	....	3
Pl. Sc. 321 Biometrics	3	2	....	....
Phys. 110 Mechanics, Electricity and Atomic Structure or Biog. 101 Principles of Biology ...	3	3	3	3

Second Year

All students entering Second Year Forestry are required to attend a 10-day field course in forest surveying at the University Research Forest near Hancy immediately following Labour Day, preceding the second year. They also are required to submit an essay of not less than 1000 words. This should take the form of a scientific report, preferably on original observations made during the summer. Any suitable subject, however, may be chosen. Emphasis will be placed upon the precise and accurate use of English, but credit will also be given for subject matter, form and illustrations. If the essay is not up to the standard of a pass mark in English it will be returned for re-writing. One copy only is required. The essays must be handed in to the Dean not later than January 15.

*Option	Required Courses
All Options	Bot. 330; Econ. 350; Engl. 250; For. 250, 261, 270, 272, 298; Pl. Sc. 321.
Forest Management	For. 251, 262; Geol. 150; Soil Sc. 203.
Forest Business Administration	Com .261; For. 262, 278; Soil Sc. 203.
Logging	For. 251, 262; Math. 155, Soil Sc. 203.
Forest Products and Wood Technology	Chem. 155; For. 278; Math. 155.
Silvics	For. 251, 262; Geol. 150; Soil Sc. 203.
Forest Pathology, Forest Entomology and Wildlife Management	For. 251, 262; Geol. 150; Soil Sc. 203.

*Students are required to continue the options they selected in their 2nd year unless permission to change is granted by the Dean.

Third Year

All students entering Third Year Forestry must take a 6-day field trip into the Interior of the Province before lectures commence in the fall term. Detailed arrangements will be announced at the close of the second year. They also must submit an essay of not less than 2000 words. It shall be a technical description of the work on which the student was engaged during the summer, or of any scientific or professional work with which he is familiar. Detailed essay requirements are available from the Faculty. Outlines of essays are due in the Dean's Office not later than October 15 and the completed essays are due January 15. Third Year students must also complete 21 days of field instruction at the University Research Forest following completion of spring examinations.

*Option	Required Courses
All Options	Com. 357; Forestry 350, 351, 363, 375, 398.
Forest Management	Com. 384; Engl. 305; For. 352, 355, 362.
Forest Business Administration	Com. 331, 364, 384; Engl. 305; For. 362 or Com. 468.
Logging	Com. 384; For. 362, 372; Phy. 155.
Forest Products and Wood Technology	Com. 384; Engl. 305; Phy. 155, 156.
Silvics, Forest Pathology and Forest Entomology	Bot. 302; Engl. 305; For. 352, 355.†
Wildlife Management	Bot. 302; For. 352, 355; Zool. 202.

*Students are required to continue the options they selected in their 2nd year unless permission to change is granted by the Dean.

†Students in the Silvics, Forest Pathology, and Forest Entomology options may elect in the fall term up to 2 units in addition to the prescribed courses.

Fourth Year

*Option	Required Courses
†All Options	For. 390, 453, 481, 499.
Forest Management	Com. 321, 458; For. 450, 463, 464 or 462, 465, 475, 480.
Forest Business Administration	Com. 321, 458; For. 463, 465 or Com. 468, For. 475, 476, 477, 480.
Logging	Ag. Mech. 304; Ap. Sc. 270; Com. 458; For. 463, 465, 472, 478, 480, 498.
Forest Products and Wood Technology	Ap. Sc. 270; For. 475, 476, 477, 478, 479; M.E. 455 or For. 466.
Silvics	Agron. 304; Bot. 425, Soil Sc. 314 and 416; For. 450, 466, 475, 480.
Forest Pathology	Bot. 303, 425; For. 418, 450, 480.
Forest Entomology	Bot. 425; For. 475, 480; Zool. 410, 412.
Wildlife Management	Biol. 322, Bot. 425; For. 463, 480; Zool. 416, 421.

*Students are required to continue the options they selected in their 2nd year unless permission to change is granted by the Dean.

†Up to 4 units of electives may be substituted for 4 units of the prescribed courses with the consent of the Dean.

Note: All students are required to complete the field work at the University Research Forest before proceeding into the fourth year.

COURSES OF INSTRUCTION

The number of units assigned to a course is given in round brackets immediately following the course number.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms. [2-3; 2-3]

1 lecture and 2 hours laboratory per week, first term. [1-2; 0-0]

1 lecture and 2 hours laboratory per week, second term. [0-0; 1-2]

2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms. [2-3-2; 2-3-2]

Students from other Faculties may take certain of the courses offered in Forestry provided they offer the necessary prerequisites, but in all such cases permission of the instructor must be obtained.

150. (2) *Dendrology*.—Identification and distribution of North American trees. Textbook: Harlow and Harrar, *Textbook of Dendrology*. Mr. Griffith and Mr. Sziklai. [2-2; 1-2]

151. *The Profession of Forestry*.—Survey of the profession, opportunities available to trained men. The Staff. [1-0; 1-0]

161. (1½) *Forest Surveying*.—Instruments and methods used in forest surveying. Textbook: Brinker and Taylor, *Elementary Surveying*. Mr. Adamovich. [0-0; 2-2]

162. (1½) **Forest Mensuration.**—Methods of Measurement of trees and stands; elementary statistics; timber cruising; log scaling. Textbook: Husch, *Forest Mensuration and Statistics*. Mr. Munro. [2-2; 2-2]

164. (1½) **Forest Photogrammetry.**—Mapping from aerial photographs; introduction to photo-interpretation, and the uses of aerial photographs in forestry. Textbook: Spurr, *Photogrammetry and Photo-interpretation*. Mr. Munro. [0-0; 2-2]

250. (1) **Foundations of Silviculture.**—The role of forest genetics and forest ecology in silvicultural research and practice; site factors; site classification; forest succession and biology of the forest community. Textbook: Spurr, *Forest Ecology*. Mr. Haddock. [0-0; 2-0]

251. (1½) **Fire Control and Use.**—Fire prevention; danger rating; fire behaviour, detection, communication, transportation and suppression; planning for control and use of fire. Mr. Smith. [0-0; 2-2]

261. (1½) **Field Work in Forest Surveying.**—Elementary surveying; field problems involving the use of compass, transit, tape, level, and plane table; topographic mapping; forest road location. Work commences immediately following Labour Day and continues for ten days at the University Research Forest. The Staff.

262. (1½) **Inventory Methods.**—Methods of forest inventory, measurement of site index, and growth. Textbook: Husch, *Forest Mensuration and Statistics*. Mr. Munro. [0-0; 2-2]

270. (2) **Wood Anatomy.**—Anatomy of wood; natural wood defects; growth-quality relations, macroscopic identification of the more important woods of North America. Textbook: Panshin, deZeeuw and Brown, *Wood Technology, Vol. I*. Mr. Wilson. [2-4; 0-0]

272. (2) **Logging Systems.**—General logging methods in use in the forest regions of North America. Mr. Mills. [2-1; 2-1]

278. (2) **Wood Physics.**—Elementary physical properties of wood in relation to its behaviour and use; microscopic identification of wood and wood pulps; preparation of wood for microscopic and wood-quality studies. Textbook: Brown, Panshin and Forsaith, *Wood Technology, Vol. II*. Mr. Wilson. [0-0; 2-4]

290. (1) **Field Work in Logging, Silvics, and Utilization.**—A 6-day field trip immediately prior to the fall term to demonstrate forest land use, and the elements of silviculture, logging, management, and utilization in the forest types of the Interior. A substantial written report is a required part of the course. Required of all students entering Third Year. The Staff.

298. **Essay.**—Students entering Second Year are required to submit an essay of not less than 1000 words. It should take the form of a scientific report, preferably on original observations made during the summer.

318. (3) **Forest Pathology.**—Symptoms, etiology, epidemiology, damage appraisal, economic loss, prevention and control of disease in trees, stands, and forest products. Mr. Bier. [2-2; 2-2]

350. (2) **Silviculture.**—Theory and practice of controlling forest establishment, composition, and growth; methods of establishing natural regeneration; crop tending practices; development of silviculture in western North America. Textbook: Smith, *Practice of Silviculture*. Mr. Haddock. [2-2*; 1-2*]

351. (3) **Forest Insect and Disease Control.**—Diseases and insects in rela-

- tion to forest protection, silviculture, management and forest products. Mr. Bier, Mr. Graham. [2-2; 2-2]
352. (1½) **Forest Genetics.**—Principles of genetics and their application to forestry; selection and breeding methods. Mr. Sziklai. [0-0; 2-2*]
355. (1½) **Seeding and Planting.**—Artificial regeneration; forest nursery practice. Textbook: Tourney and Korstian, *Seeding and Planting in the Practice of Forestry*, 3rd edition. Mr. Sziklai. [2-2*; 0-0]
362. (1½) **Data Processing and Quality Control.**—Methods of collecting, processing, and analysing forestry data; introduction to statistical quality control. Mr. Smith and Mr. Valg. [0-0; 2-2]
363. (1½) **Principles of Forest Management.**—Principles of forest organization; regulation of the cut; sustained yield forest management; working plans. Textbook: Davis, *Forest Management*. Mr. Griffith. [0-0; 2-2]
372. (2) **Logging Cost Analysis.**—Development and cost analysis of logging systems and silvicultural operations. Mr. Mills. [3-2; 1-2]
375. (3) **Manufacture of Forest Products.**—Methods used in and field studies of mills manufacturing forest products. Textbook: Brown and Bethel, *Lumber*. Mr. Valg. [2-3; 2-3]
390. (3) **Field Work in Harvesting, Silviculture, and Mensuration.**—Twenty-one field days of study at the University Research Forest is required of all forestry students preceding their final year at the University. The Staff.
398. **Summer Essay.**—Students entering Third Year are required to submit an essay of not less than 2000 words. It should be a technical description of the work on which the student was engaged during the summer, or of a scientific or professional work with which he is familiar.
410. (1½) **Principles of Forest Entomology.**—Insects in relation to forests and forestry, general objectives of forest entomology; specific problems, concepts and practices leading to forest insect control. Zoology 105 is not prerequisite to this course. Mr. Graham. [0-0; 2-2]
418. (1½) **Methods in Forest Pathology.**—Field and laboratory methods and techniques in handling disease problems in trees, stands, and forest products. Mr. Bier. [0-0; 2-2]
450. (2) **Advances in Silviculture.**—Fundamental silvicultural problems; the application of research findings to the practice of silviculture. Mr. Haddock. [2-0; 2-0]
453. (1) **Seminar.**—Oral presentation and discussion of current forestry topics; reviews of important papers in forestry periodicals. The Staff. [1-0; 1-0]
455. (2) **Directed Studies in Forestry.**—In special cases and with the approval of the instructor concerned a student may carry on directed studies of specific problems in forestry. The Staff. [0-4; 0-4]
462. (2) **Growth and Yield.**—Techniques of measuring and estimating growth and yield of trees and stands. Textbook: Spurr, *Forest Inventory*. Mr. Munro. [1-2; 1-2]
463. (1½) **Forest Land Management.**—Planning for timber production and multiple-purpose forestry. Textbook: Davis, *Forest Management*. Mr. Smith. [2-2; 0-0]

* Alternate weeks.

464. (2) **Photo-Interpretation.**—Application of photo-interpretation, photomensuration, and photo-mapping to forest management. Textbook: Spurr, *Photogrammetry and Photo-interpretation*. Mr. Munro. [2-4; 0-0]

465. (2) **Industrial Forest Management.**—Methods of procuring and managing timber resources for forest products firms. Mr. Mills. [0-0; 2-4]

466. (2) **Statistical Methods in Forest Research.**—Objectives, methods, design and analysis in forest research; sampling, transformations, variance, covariance, and multiple regression. Mr. Kozak. [0-0; 2-4]

472. (3) **Forest Transportation Systems.**—Engineering and economic aspects of the design, construction, and maintenance of forest transportation systems. Mr. Adamovich. [2-2; 2-2]

475. (2) **Forest Products Utilization.**—Utilization problems; product development; distribution and marketing of forest products. Mr. Wellwood. [2-0; 2-0]

476. (2) **Glued Wood Products.**—Types and characteristics of wood adhesives; manufacture, properties, and uses of plywood, laminated wood, and composite wood products. Mr. Valg, Mr. Wellwood. [3-3; 0-0]

477. (2) **Wood Seasoning and Preservation.**—Principles and methods of seasoning forest products; painting and finishing wood; preservative treatments. Mr. Valg, Mr. Wellwood. [0-0; 3-3]

478. (2) **Mechanical Properties of Wood.**—Factors affecting the strength of wood; timber-testing procedures; design of wood structures; mechanics of columns and beams; timber fasteners. Textbook: Scofield and O'Brien, *Modern Timber Engineering*. Mr. Adamovich. [0-0; 3-3]

479. (2) **Physical and Chemical Properties of Wood.**—Physical properties of wood in relation to moisture, heat, sound and electricity; chemical nature of the constituents of wood; wood analysis. Mr. Wilson. [3-3; 0-0]

480. (1½) **Forest History, Policy and Administration.**—The development and implementation of forest policies in Canada, the United States and other countries. Textbook: *B.C. Forest Act*. Mr. Griffith. [1-0; 2-0]

481. (3) **Forest Economics and Finance.**—Economic values and valuation of forest land, timber, forest products, forest areas and enterprises; land use, taxation, credit, insurance, appraisals. Textbook: Duerr, *Forest Economics*. Mr. Smith. [2-2; 2-2]

498. **Logging Report.**—A report is required from students in the harvesting option summarizing their summer work in the field of logging; due October 1.

499. (3) **B.S.F. Thesis.**—Each Fourth Year student is expected to undertake independent study of a subject of special interest to him. The subject chosen may be scientific or technical.

Courses for Graduate Students

In all problem and research courses, individual laboratory investigations or reviews of literature are usually planned to serve the special interests of students. When several students have a similar interest in advanced study formal lectures may be given.

549. (3-6) **M.F. Thesis.**

551. (1-3) **Problems in Forest Fire Control.**—Mr. Smith.

553. (1) **General Forestry Seminar.**—Required for the first two years in residence of all graduate students in forestry. The Staff.

555. (1-3) Research in Silvics and Silviculture.—Mr. Haddock.

556. (1) Forest Tree Seed.—Seed production, collection, provenance, testing, treatment, and the application of these to the practice of forestry. Mr. Haddock and Mr. Sziklai.

557. (1-3) Problems in Forest Genetics.—Mr. Sziklai.

560. (1-3) Problems in Forest Mensuration.—Mr. Smith and Mr. Munro.

561. (1-3) Problems in Forest Management.—Mr. Griffith and Mr. Smith.

564. (1-3) Problems in Forest Photogrammetry.—Mr. Munro.

566. (1-3) Problems in Statistical Methods.—Mr. Smith.

570. (1-3) Research in Wood Anatomy and Properties.—Mr. Wellwood and Mr. Wilson.

572. (1-3) Problems in Logging Engineering.—Mr. Mills and Mr. Adamovich.

575. (1-3) Problems in Forest Products.—Mr. Wellwood.

576. (2) Commercial Timbers of the World.—Structure, identification, properties, and uses of commercial timbers of the world. Mr. Wellwood.

578. (1-3) Research in the Properties of Wood Products.—Mr. Wellwood.

581. (1-3) Problems in Forest Economics and Finance.—Mr. Smith.

599. Thesis.—For M.A.Sc. degree.

645. Thesis.—For Ph.D. degree.

COURSES GIVEN IN OTHER FACULTIES

Agricultural Mechanics

304. (1½) Drainage.—Introduction to hydrology, rainfall and run-off relationship. [2-2; 0-0]

Agronomy

304. (1½) Range Management.—Ecology and management of range-land. [2-2; 0-0]

Applied Science

270. Strength of Materials.—An introductory course dealing with elementary relations existing between external forces and accompanying stresses, strains and deflection produced in simple types of structural and machine elements. [2-0-1; 2-0-1]

Botany

101. (3) Principles of Biology.—An introductory course emphasizing principles of wide application to all living organisms, including cell structure and function, the mechanism of inheritance, evolution, and adaptation to environment. A comparative approach to the unity and diversity of organisms will be stressed. A one-hour tutorial is required each week for those students who have not previously had Biology 11 or its equivalent in high school. [3-3; 3-3]

322. (1½) Principles of Ecology II.—Population and community ecology, with emphasis on animals. This course complements Biol. 321 and normally should be taken in the same session. [0-0; 3-0]

302. (3) Morphology & Taxonomy of Seed Plants.—The principles and

practices of seed-plant taxonomy emphasizing the use of morphological and evolutionary features in classification and identification. [2-4; 2-4]

303. (3) Biology of Microorganisms.—Morphology, reproduction, and classification of fungi and other heterotrophic plants including bacteria and viruses. [2-3; 2-3]

330. (3) Plant Physiology.—Introduction to physiological processes in plants, including photosynthesis, transpiration, absorption, enzyme and hormone action, and growth. [2-2; 2-2]

425. (3) Principles of Plant Ecology.—An introductory course dealing with the inter-relationships between plants and their environment. [2-3; 2-3]

Chemistry

155. Analytical and General Chemistry.—Chemical laws, chemical equilibrium, equilibrium applied to ionization. Atomic and molecular theory. Selected topics in inorganic chemistry such as co-ordination compounds, metal carbonyls, intermetallic compounds, clathrates. Colloidal chemistry. Oxidation and reduction reactions. Descriptive inorganic chemistry. Nuclear chemistry. Organic chemistry. [2-3-0 2-3-0]

230. (3) Organic Chemistry.—The fundamental principles of modern organic chemistry including a discussion of the main classes of organic compounds. Prerequisite: Chem. 110 or 102 (or 101). [3-3; 3-3]

Commerce

261. (3) Marketing, Physical Distribution and Foreign Trade.—A study of the basic considerations affecting the domestic and international marketing of goods and services. [3-0; 3-0]

321. (3) Industrial Relations and Personnel.—A detailed study of work environment, motivation, and morale and their influence on productivity. The practices and techniques of personnel management will be examined in terms of their effects on the organization and its employees. [3-0; 3-0]

331. (3) Commercial Law.—Introduction to the law of contracts, with particular reference to contracts for the sale of goods (Sale of Goods Act) and related law of personal property; negotiable instruments (Bills of Exchange Act); elementary principles of agency; partnership (Partnership Act) and company law (B.C. Companies Act); examination of selected legal and commercial documents. [3-0; 3-0]

357. (2) Accounting and Finance.—This course will give a foundation in basic accounting principles and elements of business finance. [2-0; 2-0]

364. (1½) Foreign Trade.—A comprehensive study of foreign trade practice, theory and policy. Emphasis will be given to current international topics and problems which affect Canadian business. [3-0; 0-0]

384. (2) Industrial Management.—A survey of industrial management principles, problems, practices, and procedures. [2-0; 2-0]

458. (2) Cost Accounting.—Principles of cost accounting and their use in the forest industry. [2-0; 2-0]

466. (1½) Industrial and Resource Marketing Problems.—Managerial problems involved in marketing Canadian industrial and agricultural commodities and basic resources; an examination through problem analysis of producer goods and the specialized channels of distribution through which they flow. [0-0; 3-0]

468. (1½) **Foreign Trade Problems.**—Problems in foreign trade dealing specifically with organization, international statistics, foreign market analysis, sales promotion, communication, and finance. Examination of tariff problems and tariff administration. Study of current developments in international trade with special emphasis on their impact on Canada's trade position.
[0-0; 3-0]

Economics

350. **Principles of Economics.**—An analytical approach to economics for students of engineering. Production decision and markets; determinants of investment, income and employment; international trade; public finance and government policies.
[2-0-0; 2-0-0]

English

150. **Composition.**—The work consists of (1) essays, class exercises, and selected reading; (2) written examinations. Students will be required to make a passing mark in each..
[2-0-0; 2-0-0]

250. **Reading and Composition.**—Students will be asked to read half-a-dozen outstanding novels and to write essays on the ideas they encounter in these.
[2-0-0; 2-0-0]

305. **Studies in Literature.**—Selected readings in great writers of the past and present. For a full description of the course students should apply to their faculty office.
[1-0-1; 1-0-1]

Geography

202. (3) **Introduction to Weather and Climate.**—Atmospheric elements, meteorological instruments and practical weather observations; climate classifications; regional climatology with emphasis upon British Columbia. Throughout the course attention will be given to the relation between climatology and vegetation.
[2-2; 2-2]

Geology

150. **General Geology.**—Physical and historical geology covering materials of the earth, geological structures and processes, mineral deposits, erosion, and the history of the earth and its inhabitants.
[2-2-0; 2-2-0]

Mathematics

155. **Calculus.**—Differentiation and integration of the elementary functions of one variable with applications.
[4-0-0; 4-0-0]

Mechanical Engineering

154. **Mechanical Drawing and Graphics.**—Pencil and ink work in orthographic drawing, lettering, technical sketching, graphical presentation of data, processes for reproducing data.
[0-0-3; 0-0-3]

455. **Industrial Engineering.**—Quality control; statistical methods; control charts; time and motion study; production control; plant layout and material handling.
[1-0-3* 1-0-3*]

Plant Science

321.(1½) **Biometrics.**—Elementary principles of the analysis presentation and interpretation of biological data.
[2-2; 0-0]

Physics

110. (3) **Mechanics, Electricity and Atomic Structure.**—Prerequisite: Phy-

sics 11. Mathematics 120 must precede or be taken concurrently with this course. [3-3*-2*; 3-3*-2*]

120. (3) **Matter and Mechanics.**—The structure and properties of matter, Newtonian mechanics of particles, laboratory investigations emphasizing the use of electrical instruments. Textbook: M.I.T. Science Teaching Center, Physics, *A New Introductory Course, Parts I and II*. Prerequisites: Physics 11 and 12. Mathematics 120 must precede or be taken concurrently with this course. [2-3-1; 2-3-1]

155. **Mechanics.**—The principles of statics and dynamics; work and energy, impulse and momentum for linear and curvilinear motion; virtual work, friction; gravitational systems and elementary orbital motion. [2-0-4; 2-0-4]

156. **Heat, Light and Sound.**—The thermal properties of matter; the first and second laws of thermodynamics. Reflection, refraction of light; elementary atomic theory and the origin of spectra. Wave motion and the propagation of sound; sound intensity and absorption; measurements. [2-3*-0; 2-3*-0]

Soil Science

203. (2) **General Forest Soils.**—Formation, classification, utilization, conservation and soil-plant relationships with emphasis on forest soils; physical, chemical and biological characteristics of soils. Credit will not be given for both Soil Science 200 or 203. [1-2; 2-2]

314. (1½) **Soil Conservation.**—Conservation of soil resources in Agriculture and Forestry; run-off and erosion, conservation practices. Prerequisites: Soil Science 200 or 203. [2-2; 0-0]

416. (1½) **Soil Genesis, Classification and Cartography.**—Factors of soil formation, field description, classification and cartography of soils; nature, distribution and use of soil groups. (Some field work is required.) Prerequisite: Soil Science 200 or 203. [0-0; 2-2]

Zoology

202. (3) **Vertebrate Zoology.**—Comparative anatomy; evolution and phylogeny of vertebrates; dissection of representative forms. [2-3; 2-3]

410. (3) **Entomology.**—Functional morphology, taxonomy, biology and physiology of insects; a detailed consideration of selected aspects. [2-3; 2-3]

412. (3) **Principles and Problems in Economic Entomology.**—The principles and tasks of economic entomology; its funds of information; the problems inherent in biological material; special problems in economic entomology; methods of extending, interpreting and applying knowledge of economic entomology. [2-2; 2-2]

416. (3) **Biology of the Vertebrates.**—The evolution and major features of the terrestrial vertebrates. The form and function of terrestrial vertebrates as related to their distribution and abundance. The laboratory part of the course includes the classification, life histories, and ecology of terrestrial vertebrates with particular attention to those of British Columbia. [2-3; 2-3]

421. (3) **Principles of Wildlife Biology and Conservation.**—Biological principles of economically important birds and mammals. Zoology 416 and Biology 322 prerequisite or concurrent. [2-2; 2-2]

The University Research Forest

An area comprising a block of land about 7 miles long and 2½ miles wide, situated north of the town of Haney, was Crown-granted to the University by the Provincial Government on March 25, 1949. This area is well suited for field instruction in cruising, mensuration, silviculture, logging engineering and management, and for research in forestry and related sciences.

A gift of \$140,000 by the B.C. Loggers' Association has provided a well equipped and effective camp centrally located in the area. This camp provides accommodation for 60 students and staff engaged in field practice and research.

The University Campus Forest

The Campus Forest portion of the Botanical Garden consists of a narrow belt south and west of the University, and is an example of the lowland stands on the southern coast. It contains the principal species of trees and shrubs of the region, including old trees as well as young growth of different ages. It serves as a convenient demonstration and field study area for the Faculty of Forestry, and Departments of Biology and Botany and Zoology.

A small forest nursery is operated within the Botanical Garden nursery and is used for experimentation and demonstration.

CANADA DEPARTMENT OF FORESTRY Forest Products Research Laboratories Vancouver Laboratory

R. E. FOSTER, B.A., B.S.F. (Brit. Col.), Ph.D. (Toronto), Director.

The Vancouver Laboratory is one of two laboratories in the Federal Department of Forestry organized to carry out research on forest products. The second laboratory is located in Ottawa, serving the forest products industries of Eastern Canada with the exception of the pulp and paper industry which maintains a laboratory in Montreal — the Pulp and Paper Research Institute of Canada — for the purpose of investigating problems relating to pulp and paper research.

The Vancouver Laboratory has been maintained in close association with the University of British Columbia since its establishment in 1918. Research programmes at both it and the Ottawa Laboratory are co-ordinated through the Forest Products Research Branch of the Department of Forestry with headquarters in Ottawa.

Six major sections at the Vancouver Laboratory provide facilities and equipment necessary to cover a wide range of investigations in timber mechanics, plywood and wood anatomy, wood preservation, wood pathology, wood chemistry, and wood utilization. Close co-operation with industry in British Columbia and Alberta permits the ready application of research findings to commercial practice.

Contact is maintained with other forest products research organizations throughout the world, thus permitting a free exchange of technical information on a wide range of forest products subjects which is made available to the timber industry and to all interested in the use of wood. This technical service has been a most important function of the laboratory. The association between the staff of the laboratory and the University, and the ready availability of specialized equipment necessary to carry out many intricate studies, have greatly enhanced the value of the laboratory to the general public and also to the University.

**THE FACULTY
OF
GRADUATE STUDIES**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**



The Faculty of Graduate Studies calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details consult this publication. *In general, application must be made to the Dean of Inter-Faculty Affairs.*

FACULTY OF GRADUATE STUDIES

IAN McTAGGART COWAN, B.A. (Brit. Col.), Ph.D. (California), F.R.S.C.,
Dean of the Faculty.

Membership of the Executive Committee of the Faculty:

Ex-officio Members—DEAN IAN McTAGGART COWAN (Chairman), DEAN
W. H. GAGE, DR. M. DARRACH (Curriculum Committee), Registrar
(Secretary).

Elected Members—

DR. R. M. THOMPSON, MR. J. BIELY, DR. R. W. STEWART; terms expire
1966.

DR. C. A. BROCKLEY, DR. G. DUTTON, DR. B. MOYLS; terms expire 1967.

DR. J. S. CONWAY, DR. G. E. ROUSE, DR. D. V. SMILEY, terms expire 1968.

Membership of the Faculty

Ex-officio Members—The President, the Dean of the Faculty of Graduate
Studies, the Dean of Inter-Faculty and Student Affairs, the Librarian.

All full-time Professors, Associate Professors and Assistant Professors
teaching graduate courses or supervising graduate theses, and all Instructors
and Lecturers actively engaged in the supervision of graduate studies.

Degrees Offered

The degrees offered in the Faculty of Graduate Studies are Doctor of
Philosophy (Ph.D.), and Doctor of Education (Ed.D.); Master of Arts
(M.A.), Master of Science (M.Sc.), Master of Applied Science (M.A.Sc.),
Master of Science in Agriculture (M.S.A.), Master of Forestry (M.F.), Master
of Science in Pharmacy (M.S.P.), Master of Business Administration
(M.B.A.), Master of Education (M.Ed.), Master of Architecture (M.Arch.),
Master of Physical Education (M.P.E.), Master of Laws (LL.M.), Master of
Music (M.Mus.).

THE DEGREES OF Ph.D. AND Ed.D.

Admission

1. To become candidates for a doctoral degree graduate students must
apply by letter to the Registrar. Applications should be submitted before
March 1 and will not be accepted after August 1.

2. (a) Candidates for the Ph.D. degree must satisfy the Executive Com-
mittee of the Faculty of Graduate Studies that they are competent to
proceed to the course of study proposed and must hold either

(i) a Master's degree (or equivalent), or

(ii) a Bachelor's degree with Honours (or equivalent).

(b) Candidates for the Ed.D. degree must satisfy the Executive Com-
mittee of the Faculty of Graduate Studies that they are competent to pro-
ceed to the course of study proposed and must hold a Master's degree (or
equivalent) in Education, with standing of sufficient quality to warrant
admission to the programme.

Candidates will normally be required to spend a minimum of three winter
sessions at the University. Those possessing a Master's degree (or the
equivalent) may have this period of time reduced by the Executive Com-
mittee of the Faculty of Graduate Studies.

Students with a First Class Honours degree who might wish to proceed direct to the Ph.D. degree will be required to take at least nine units of course work during their first session. If at the end of that session they obtain First Class standing in at least five units of course work, have an over-all First Class standing and have demonstrated an ability to do independent work, they may be allowed by the Executive Committee to proceed direct to the Ph.D. degree without having to complete the Master's degree.

3. Each candidate must satisfy the Executive Committee of the Faculty of Graduate Studies of his competence in the English language. The choice and number of languages other than English, and the standard and competence required in such languages, will be determined by the department in which the candidate intends to write his thesis.

4. As the number of candidates that can be accommodated is limited, students, no matter how well qualified, can be accepted only if there is a vacancy in the specific field in which they propose to major.

5. Since candidates for the Ph.D. or Ed.D. degree are expected to devote full time to their academic programme, candidates who undertake remunerative employment other than Teaching Assistant duties, must obtain prior permission of the Executive Committee of the Faculty of Graduate Studies through the department or departments concerned. They may be required to spend additional time in residence or supervised study before coming up for the final examination. The amount and nature of this additional time will be determined by the Executive Committee in consultation with the departments concerned.

6. Agreement to microfilm the thesis and publish a suitable abstract of the doctoral dissertation is prerequisite to the awarding of the doctoral degree. Forms for this purpose may be obtained from the Special Collections Division in the Library.

Courses of Study

1. The work of each candidate will be supervised by a Candidate's Committee consisting of not less than three members, at least one of whom may be chosen from a department other than that in which the candidate is writing his thesis. This Committee will assist the candidate to plan his work, supervise his research, and direct the preparation of his thesis.

2. Upon registration an applicant must outline his proposed programme of study on forms obtainable in the Registrar's office. The programme must be approved both by the Candidate's Committee and by the Dean of the Faculty of Graduate Studies. Work for the Ph.D. or Ed.D. degree will consist of seminars, assigned readings, consultations, and such formal courses as may be deemed essential for the fulfillment of the requirements for the degree. A major part of the candidate's work will consist of a thesis embodying the results of original research. The Executive Committee of the Faculty of Graduate Studies shall require the thesis to be submitted to an outside examiner or examiners approved by the Dean.

3. At the doctoral level the requirements of different subjects and departments vary so greatly that the precise amount of course work needed cannot be specified in a uniform fashion. It shall be the duty of each candidate's committee to recommend the kind and number of courses to be taken. The recommendation of the candidate's committee regarding the course work shall be subject to the approval of the Department concerned and of the Executive Committee of the Faculty of Graduate Studies.

4. Unless, in the opinion of the Executive Committee of the Faculty of Graduate Studies, the delay has been justified by circumstances that are altogether exceptional, candidates who have not received their degree at the end of six winter sessions will be required to withdraw.

Examinations and Thesis

1. The progress of all Ph.D. and Ed.D. candidates will be reviewed in the spring of each year, and the Executive Committee of the Faculty of Graduate Studies may require any candidate to withdraw if his work has not been satisfactory. If a candidate for the degree of Ph.D. or Ed.D. fails to obtain 65 per cent in any course, the Executive Committee of the Faculty will deal with the matter after consultation with the department concerned.

2. The examinations required will be determined by the department concerned, with the approval of the Executive Committee of the Faculty of Graduate Studies. These will consist of the following: (a) course examinations, in which candidates are required to secure at least Second Class standing; (b) examinations to test the candidate's ability to read the foreign languages required for his programme of study; (c) a comprehensive written and/or oral examination which normally will be held when the candidate has completed all course work required, and which is intended to test his grasp upon his chosen field of study as a whole; and (d) a final oral examination for the degree.

3. Examinations in the formal course work must be completed before a candidate takes the final oral examination.

4. A candidate's thesis must be presented in the form described in the leaflet entitled *Instructions for the Preparation of Graduate Theses*, copies of which may be obtained from the Special Collections Division in the Library, or from the Registrar.

Courses for Credit

Only the following courses will be accepted for Ph.D. or Ed.D. credit:

(a) Graduate courses numbered 500 or above offered in the department or departments concerned, provided credit has not already been obtained for such courses.

(b) Certain courses numbered 400 or above in related subjects as approved in particular cases on the recommendation of the department concerned.

COURSES LEADING TO THE MASTER'S DEGREE

Admission

1. Students registering as graduates must hold either a Bachelor's degree from this University or its equivalent. Students completing their courses for the B.A., B.Sc., B.S.A., or B.Ed. degree may, if they lack not more than 6 units, register in courses open to graduate students provided that they keep within an over-all maximum of 18 units. They will receive credit for such courses towards a higher degree only after registering as candidates for such a degree.

2. A graduate of another university applying for permission to enter as a graduate student is required to submit with his application to the Registrar, on or before August 1, an official statement of his graduation and a transcript of his academic record. In addition, he must state specifically the degree sought and the department or field in which he desires to study. He must also give the names and addresses of at least two of the professors under

whom he has worked and who would be willing to give a confidential assessment of the applicant's capacity for graduate work. The Executive Committee of the Faculty of Graduate Studies will determine the standing of such student in this University.

3. Graduate students must register in the same registration period as undergraduates. Those attending this University for the first time within the last five years and taking 6 units or more, are required to have a medical examination completed by their family physician. The medical form is obtainable from the Registrar and must be submitted, prior to commencement of lectures, to the Health Service office.

4. The Master's degree is offered in various approved fields, and in each field the degree conferred will be that which, in the view of the Faculty, describes most appropriately the character of the work done.

- (a) If the field of study lies wholly within a single department the Master's course must be chosen in consultation with that department and approved by its head.
- (b) If the field of study involves work in more than one department the candidate's course must be approved by a standing inter-departmental committee appointed by the Executive Committee of the Faculty of Graduate Studies to represent the departments concerned.
- (c) If the field of study is one which does not fit into the present departmental structure of the University the candidate's course must be approved by the special committee which will supervise his work. The course so chosen must also be approved by the Executive Committee of the Faculty of Graduate Studies.

5. Candidates for the Master's degree must hold a Bachelor's degree with

- (a) Honours in the field of the proposed Master's course with First Class standing in at least two (6 units) of the Third and Fourth Year courses in that field, or
- (b) First Class standing in at least two (6 units) of the courses and at least Second Class standing in each of the remaining courses of Third and Fourth Year work prescribed by the department or departments concerned as prerequisite to the Master's course.

The prerequisites for courses of study arranged in accordance with paragraph 4 (c) will comprise a Bachelor's degree with First Class standing in at least two of the courses and at least Second Class standing in each of the remaining courses of the Third and Fourth Year work prescribed by the special committee in charge of the field of study as prerequisite to a Master's course in that field.

6. Graduate students who do not meet the full requirements of Section 5 may be permitted to make up any deficiencies and to proceed concurrently in the Master's course provided that they keep within an over-all maximum of 18 units (or the equivalent in the departments of Applied Science and Forestry) in any one winter session, but may receive credit for such courses only if they become candidates for the Master's degree in accordance with Section 5.

7. In determining whether standing received by a student in an undergraduate course meets the requirement for admission to candidacy, the Faculty will consider the mark obtained by the student in his first final examination on that course, unless the student has obtained permission from the Executive Committee, after consultation with the department concerned, to write a supplemental examination or to repeat the course in order to improve his standing.

8. Each candidate must satisfy the Head of the Department in which he intends to write his thesis of his competence in the English language. The choice and number of languages other than English, and the standard and competence required in such languages, will also be determined by the Head of the Department.

Course

1. Candidates for the Master's degree are required

- (a) to spend at least one winter session in resident graduate study unless, in exceptional circumstances, prior permission for other arrangements has been granted by the Executive Committee;
- (b) to complete their programmes within five years of initial registration; approval of the Executive Committee is necessary for any extension beyond this period;
- (c) to register for each session during their candidacy.

2. Since graduate students are expected to devote full time to their reading, courses, and research, those who undertake remunerative employment must be prepared to spend additional time before coming up for the final examination. All such students must obtain the prior permission of the department or departments concerned and must meet residence requirements. Those whose duties (including preparation and performance) are in excess of 12 hours weekly will not be allowed to come up for final examination in less than two full winter sessions of supervised study after registration as graduate students; those whose duties do not exceed this amount may be permitted to qualify for a degree after one winter session (September to May) of the University attendance provided that they complete, before or after the winter session, an additional three to four months of research work fully satisfactory to the department or departments concerned and have received prior approval, through these departments, from the Executive Committee.

3. The Master's programme will require a thesis (except the M.Ed.), counting from 3 to 6 units, and courses numbered 300 or above so that the total number of units, including the thesis, is at least 18 (or the equivalent in the departments of the Faculties of Applied Science and Law). The programme will normally include at least 6 units of courses numbered 500 or above. If the degree is to be taken in a single department, at least 3 and not more than 6 units must be taken in related fields outside the department, except by special permission of the department concerned. The Master's thesis in Law is valued at 10 units.

4. Except as provided in Sections 1 and 6, no credit towards the Master's degree will be given for work done prior to registration as a candidate for that degree.

5. A student whose work is considered to be unsatisfactory may be required to withdraw from the Faculty.

Examinations and Thesis

1. A student taking courses in the Faculty of Graduate Studies to fulfil prerequisites or for credit towards a degree will receive credit for each course in which he obtains at least 65%. Pass standing (P) will be granted for each course in which he obtains at least 60%. However, only 3 units of Pass standing may be credited towards a graduate degree.

2. Candidates for the Master's degree must submit in its final form three typewritten copies of the thesis, with a certificate signed by two members of the faculty, department or departments concerned stating that the required standards of a Master's thesis have been met, an abstract approved by the department or departments concerned, and a biographical note. The date of submission of the thesis to the department concerned is not later than one week following the last day of lectures in the second term. (See circular entitled *Instructions for the Preparation of Graduate Theses*, obtainable from the Special Collections Division in the Library or from the Registrar.

3. A general examination in the field of the Master's course will be held at the discretion of the faculty, department or departments concerned. Examinations may be written or oral, or partly written and partly oral.

4. Each graduate student who wishes to become a candidate for the Master's degree must, on or before October 1, file in the Registrar's office an official memorandum signed by the head of the department concerned, or by the chairman of the special or interdepartmental committee in charge of the field of study in which the candidate's work lies, showing the prerequisites, if any, that remain to be completed and the courses required for the degree. The form for this purpose should be obtained from the Registrar's office at the time of registration. Subsequent changes in the student's programme must be authorized by the head of the department or committee chairman on the approved change-of-course form obtainable from the Registrar. Candidacy for the degree will not be approved by the Executive Committee until all prerequisites have been completed.

Supplementals

1. In a course in the programme leading to the Master's degree a supplemental may be granted in the course concerned:

(a) if, in the winter session, a candidate has obtained a final mark of not less than 50 per cent in the course concerned and has obtained at least 9 units of credit in that session; but no such candidate will be granted supplementals in more than two courses and then only in subjects whose total value does not exceed 6 units;

(b) if, in the summer session, a candidate has obtained a final mark of not less than 50 per cent in the course concerned and has obtained at least 3 units of credit in that session.

2. No candidate will be granted more than one supplemental in respect of the same course; but, with the permission of the Executive Committee the course may be repeated, or a permissible course may be taken in its place.

3. A supplemental must be written at the regular supplemental examination period following the examination in which the candidate failed to obtain adequate standing.

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory

arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

Supplemental examinations for summer session students are held on the second day of the summer session at the University. Arrangements may be made for these examinations to be held at the University of Victoria.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Fees

The Graduate Student Centre fee of \$12.00, authorized by the Board of Governors for the support of the Graduate Student Centre, is required of all "on campus" students registered in the Faculty and is payable in full at the time of registration. Graduate students in Summer Session are assessed a fee of \$3.00. The Alma Mater Society fee of \$29.00, authorized by the Board of Governors, is required of all students in their first year in the Faculty.

(a) Ph.D. or Ed.D. degree:	1st Term	2nd Term	Total
First Year	\$191.00	\$150.00	\$341.00
Second Year	162.00	150.00	312.00
Third Year	162.00	150.00	312.00
each subsequent year on campus	62.00	.....	62.00
each subsequent year off campus	25.00	.....	25.00

A student taking a master's degree at the University of British Columbia and then proceeding to a doctor's degree shall pay fees as listed for the Ph.D. degree beginning at the Third Year. A student with the master's degree from elsewhere will be exempt the fees as scheduled for the Third Year.

A student who fails to register as required will forfeit his candidacy; it will be re-established only if his application for reinstatement is approved by the Head of the Department concerned and the Dean of Graduate Studies, and the student pays a fee of \$100.00 plus any applicable incidental fees.

- (b) Master's degree:
18-21 unit programme. Total fee \$600.00 plus Grad. Stud. Centre fee and A.M.S. fee when applicable.

	1st Term	2nd Term	Total
1st Year	\$191.00	\$150.00	\$341.00
2nd Year	162.00	150.00	312.00

Candidates completing the degree requirements before the end of the 2nd Year will be required to pay the balance of fees before the degree is conferred.

	1st Term	2nd Term	Total
each subsequent year on campus	\$ 62.00	.....	\$ 62.00
each subsequent year off campus	25.00	.....	25.00

A student who fails to register as required will forfeit his candidacy; it may be re-established only if his application for reinstatement is approved by the Head of the Department concerned and the Dean of Graduate Studies, and the student pays the total of the prescribed fees for the years in which he failed to re-register. Any student who completed residence requirements prior to September 1965 will be required only to re-register and pay fees for the session in which work for the degree is to be completed.

30-36 unit programme (Planning; Business Administration)

	1st Term	2nd Term	Total
1st Year	\$261.00	\$220.00	\$481.00
2nd Year	232.00	220.00	452.00

- (c) Master's candidates taking their course work during Summer Sessions or those who do not pay the fees as indicated in (b) will be assessed fees on a course basis. The Summer Session Association or A.M.S. fee will be assessed on registration in each session. Master's candidates taking their course work during Winter Sessions may attend Summer Session courses, if recommended by their study programme advisors, without further payment of fees.
- (d) Graduate students accepted as candidates for a graduate degree who are required to take prerequisite courses may do so up to a total of 9 units of course work without additional fee; they are subject to sessional fees of \$30.00 per unit for courses beyond 9 units, in addition to the regular course fees of a graduate programme. Graduate students not so accepted will be assessed fees on a per unit basis for all courses taken. Fees paid under these circumstances will not subsequently be credited in a graduate degree programme.
- (e) Graduate students not working toward a graduate degree will be registered as Unclassified and will be assessed fees on the same basis as for "Part-time Students".

FACULTIES AND DEPARTMENTS OFFERING GRADUATE WORK (listed alphabetically)

AGRICULTURE

The Doctor of Philosophy degree is offered in Dairying and Soil Science, Animal Science and Poultry Science, and Genetics.

The Master of Science degree is offered in Animal Science, Food Science, Genetics, Plant Science, Poultry Science, and Soil Science.

The Master of Science in the Agriculture degree is offered in each of the departments and fields of study listed below. Prerequisite standing for admission is graduation in the Honours programme of the B.S.A. degree or the equivalent. Graduates of the general programme with sufficiently high standing are eligible for admission on condition that, if necessary, additional course work be completed to give the equivalent of the Honours programme.

Agricultural Economics—M.S.A. degree

Prerequisites: Honours in Agricultural Economics or Economics; or at least 9 units in Agricultural Economics together with 6 units of Third and Fourth Year work in Economics or Political Science.

500. (1-3) Graduate Seminar.

501. (3) **Advanced Marketing.**—Price-making forces at retail, wholesale and farm market level. Critical analysis of various marketing schemes. Prerequisite: adequate background in economics.

502. (3) **Agricultural Problems and Policy.**—Influential doctrines in agricultural policy; problems of economic efficiency and welfare. Critical review of present and proposed price and income policies. Prerequisite: adequate background in economics.

504. (3) **Extension Planning and Evaluation.**—A study of the relative effectiveness of various methods for the diffusion of agricultural information.

530. (1-3) **Directed Studies.**—On an approved problem.

549. (5-6) **Master's Thesis.**

Agricultural Extension—M.S.A. degree

Prerequisites: Honours B.S.A. or General Course B.S.A. of the University of British Columbia or equivalent, fulfilling the requirements of Admissions Section 5(b), together with satisfactory Agricultural Extension experience.

The course consists of a thesis counting 3 units, 9 units of senior or graduate courses in Agriculture, and 9 units of courses to be chosen from Education 412, 514, 516, 518, 583 and Agricultural Economics 403.

Agricultural Mechanics—M.S.A. degree

Prerequisites: Honours; or Second Class standing in at least 12 units in the Department chosen from courses offered in the Third and Fourth Years.

500. (1-3) Graduate Seminar.

501. (3) **Advanced Food Mechanics.**—Problems in the selection and operation of food-processing machinery. Problems in specific industries may be attempted by individual students where feasible. Prerequisite: Agricultural Mechanics 401.

530. (3) **Directed Studies.**—On an approved problem (farm power and machinery, farm structures, irrigation and drainage, processing).

549. (5-6) **Master's Thesis.**

Agronomy—M.S.A. degree

Prerequisites: Honours; or completion of required undergraduate courses in the option selected for graduate study.

Animal Science—M.S.A. and M.Sc. degrees

Prerequisites for M.S.A.: Honours; or at least 12 units in Animal Husbandry chosen from courses offered in the Third and Fourth Years.

Prerequisite for M.Sc.: A Bachelor's degree with acceptable courses in fields of study related to Animal Science. Applicants, otherwise acceptable, who do not have 6 units of approved courses in Animal Science may take them concurrently with the Master's programme.

500. (1-3) Graduate Seminar.

513. (3) Advanced Animal Breeding.—Special phases and recent research findings. Lectures, seminars and research.

520. (3) Advanced Animal Physiology.—Rumen metabolism, reproduction and milk secretion in domestic animals.

522. (3) Advanced Animal Nutrition.—Special phases of animal nutrition. Nutritional deficiency state, bioenergetics and growth.

530. (1-3) Directed Studies.—On an approved problem.

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

Animal Science and Poultry Science—Ph.D. degree

(1) Opportunities are available for advanced studies concerned with basic aspects of Animal and Poultry Science.

(2) Studies in cognate fields will be selected in consultation with the candidate's committee.

Dairying—M.S.A. degree

Prerequisite: Honours; or at least 12 units in Dairying chosen from courses offered in Third and Fourth Years.

500. (3) Graduate Seminar.

530. (3) Directed Studies.—On approved problems.

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

Dairying and Soil Science—Ph.D. degree

1. A course is offered in the major field of agricultural microbiology.

2. Courses in cognate subjects will be selected in consultation with the departments.

Food Science—M.S.A. and M.Sc. degrees

Food Science is not treated as a department but as a field of study offered cooperatively within the Departments and Divisions of the Faculty of Agriculture.

Prerequisite: A bachelor's degree in Food Science or a bachelor's degree with acceptable courses in fields of study related to Food Science.

500. (1-3) Food Science Graduate Seminar.

530. (1-3) Food Science Directed Studies.

549. (5-6) Food Science Master's Thesis.

Genetics—Ph.D. and M.Sc. degrees

1. Genetics is not treated as a department, but as a field of study. Instruction is offered cooperatively by the Departments of Botany, Microbiology, Poul-

try Science, and Zoology, the Divisions of Animal and Plant Science, the Faculty of Forestry, and the Department of Paediatrics in the Faculty of Medicine.

2. The following courses will be accepted for credit:

- (a) Appropriate graduate courses in the departments and faculties mentioned.
- (b) Certain courses numbered 400 and above in genetics and related subjects as approved in particular cases.

Horticulture—M.S.A. degree

Prerequisites: Honours; or completion of required undergraduate courses in the option selected for graduate study.

501. (3) **Advanced Pomology.**—Discussion of current research problems, systematic pomology, developmental and reproductive physiology, determination of nutrient requirements of fruit crops, morphogenesis. Open to graduate students with a background in pomology and physiology. Text: Childers, *Modern Fruit Science*. Offered in 1966-67 and alternate years.

517. (3) **Advanced Vegetable Crops.**—The improvement and production of vegetable crops, with emphasis on research methods and current problems. (Offered in 1967-68 and alternate years.)

Plant Science—M.Sc. degree

Prerequisites: Honours in Plant Science or a Bachelor's degree with acceptable courses in fields of study related to Plant Science. Applicants, otherwise acceptable, who do not have 6 units of approved courses in Plant Science, may take them concurrently with the Master's programme.

The M.Sc. course includes a thesis counting 6 units.

Plant Protection 508. (3) **The Ecology and Physiology of Weed Control.**—Effects of environmental factors and phytotoxic agents on unwanted plants. Permission of instructor.

Plant Protection 509. (3-5) **Advanced Plant Pathology.**—Laboratory and field techniques and procedures. Experimental methods, culture methods, virus studies, miscellaneous experimental methods, interpretation of experimental results.

Plant Science 500. (1-3) **Graduate Seminar.**

Plant Science 507. (3) **Advanced Plant Genetics and Breeding.**—The genetics of crop plants. Prerequisite: Plant Science 407 or equivalent.

Plant Science 512. (1-3) **Responses of Plants to Controlled Environments.**—Experimental modification of the plant environment and its effects on growth, development, and post-harvest characteristics. Lectures and laboratories. Prerequisites: Botany 306 or Plant Science 344.

Plant Science 530. (3) **Directed Studies.**

Plant Science 549. (5-6) **Master's Thesis.**

Plant Science 649. **Ph.D. Thesis.**

Poultry Science—M.S.A. and M.Sc. degrees; Ph.D. degree in combination with Animal Science.

Prerequisite: a Bachelor's degree with acceptable courses in fields of study related to Poultry Science. Applicants, otherwise acceptable, who do not have 6 units of approved courses in Poultry Science, may take them concurrently with the Master's programme.

500. (1-3) **Graduate Seminar.**

513. (1½) Poultry Genetics III.—Advanced population genetics and biometrical genetics. Textbook: Falconer, *Quantitative Genetics*, and selected research literature. Prerequisite: Poultry Science 413.

522. (3) Nutritional Bio-assay Techniques.—References: A.O.A.C. *Methods of Analysis*; Emmens, *Principles of Biological Assay*. To be taken only with consent of instructor.

523. (1½) Biometrical Techniques.—Advanced biometrical techniques in agricultural experimentation. Prerequisite: Poultry Science 322 or equivalent. (Given in 1968-69 and alternate years.)

530. (3) Directed Studies.—On an approved problem. (Breeding, nutrition, physiology or poultry products marketing and technology.)

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

Soil Science—M.S.A. and M.Sc. degrees

Prerequisite for M.Sc.: A Bachelor's degree, with acceptable courses in fields of study related to Soil Science. Applicants, otherwise acceptable, who do not have 6 units of approved courses in Soil Science, may take them concurrently with the Master's programme.

500. (2) Graduate Seminar.

504. (1½-3) Advanced Soil Chemistry.—A study of research findings in specific phases of Soil Chemistry.

512. (1½-3) Advanced Soil Microbiology.—Lectures and laboratories relating to modern methods, concepts and research in soil microbiology. Prerequisites: Chemistry 230 and Soil Science 312 or by permission of instructor. (Offered in the second term.)

513. (1½-3) Advanced Soil Physics.—A study of research findings in specific phases of Soil Physics.

530. (3) Directed Studies.

549. (5-6) Master's Thesis.

649. Ph.D. Thesis.

APPLIED SCIENCE (Engineering)

The Doctor of Philosophy degree is offered in Chemical Engineering, Civil Engineering, Electrical Engineering, Mechanical Engineering, and Metallurgy. The Master of Science is offered in Metallurgy.

The Master of Applied Science is offered in each of the departments listed below. In addition to the prerequisites stated below, applicants must have completed the requirements of section 5(b), page O10.

Chemical Engineering—Ph.D. and M.A.Sc. degrees*Ph.D. degree*

The Department offers facilities for research studies in the following fields:

- (a) Mass, momentum and heat transfer;
- (b) Chemical engineering unit operations;
- (c) Applied thermodynamics and kinetics.

M.A.Sc. Degree:

Prerequisite—Graduation or equivalent in Chemical Engineering or graduation in Mechanical Engineering, Metallurgical Engineering, or the Chemical Engineering option of Engineering Physics.

Course—Must include Chemical Engineering 598, and at least five additional units chosen from graduate courses in the Department, and from 3 to 6 units for approved courses outside the Department, to a total of 12 units. Thesis 6 units.

550. (1-2) Industrial Kinetics and Catalysis.—Chemical reaction kinetics and catalytic processes; heat and mass transfer in industrial reactors; design of catalytic converters.

551. (1-2) Chemical Engineering Thermodynamics.—Pressure-volume-temperature relations; chemical equilibria by Gibbs' method; vapor-liquid equilibria; thermodynamic calculations by third law and quantum-statistical methods.

552. (1-2) Optimization Methods.—The mathematical and experimental techniques for optimizing processes will be discussed. Course content will vary from year to year, but will be chosen from the topics: direct search techniques, unconstrained optimization, Jacobian and Lagrangian optimization, mathematical programming, and variational calculus techniques.

553. (1-2) Mathematical Operations in Chemical Engineering.—Topics to be discussed will vary from year to year. Amongst these will be dimensional analysis and model theory; treatment and interpretation of chemical engineering data; formulation and solution of differential and finite difference equations; graphical, numerical and statistical methods.

554. (1-2) Momentum, Heat and Mass Transfer.—Prediction of velocity, temperature, and concentration profiles for flowing fluids; unifying concepts and analogies in momentum, heat, and mass transport; streamline flow and turbulence, molecular and eddy conduction and diffusion, boundary layers, smooth and rough conduits and other boundaries. References: Bird, Stewart and Lightfoot, *Transport Phenomena*, and current literature.

555. (1-2) Solvent Extraction and Gas Absorption.—Mass transfer in liquid-liquid and gas-liquid systems. Design of extraction and of absorption columns

for height and for diameter. Gas-liquid and liquid-liquid equilibria. References: Treybal, *Liquid Extraction*; Sherwood and Pigford, *Absorption and Extraction*; and current literature.

556. (1-2) **Distillation.**—Systems of complete and of limited miscibility; multicomponent systems; graphical and analytical design methods; azeotropic and extractive distillation.

557. (1-3) **Fluid and Particle Dynamics.**—Review of vector and tensor analysis; Navier-Stokes equations; discussions on topics which may include hydrodynamic stability, turbulence, non-Newtonian flow, and gas, liquid and solid particle mechanics.

558. (1-2) **Process Heat Transfer.**—Steady state and transient state studies; calculation and design of industrial heat exchangers.

559. (1-3) **Topics in Chemical Engineering.**—A discussion of some aspects of modern Chemical Engineering. Subject matter varies each year.

598. (1) **Seminar.**—Presentation and discussion of current topics in chemical engineering research.

599. (6) **Thesis.**—For M.A.Sc. degree.

699. **Thesis.**—For Ph.D. degree.

Civil Engineering—Ph.D. and M.A.Sc. degrees

M.A.Sc. Degree:

Prerequisite: Graduation in Civil Engineering.

Course—Includes at least 6 units chosen from graduate courses in the Department, and other approved courses.

Note: All courses listed are not necessarily offered each year.

Ph.D. Degree:

Facilities are provided for study in the general fields of structural engineering, hydraulics, and soil mechanics; studies in cognate fields will be selected in consultation with the candidate's committee.

550. (1½) **Advanced Strength of Materials.**—Beams on elastic foundations; beam-columns; trigonometric series; centre of twist; shear deflection; buckling of columns by integration and energy methods; buckling of circular beams. Mr. Hrennikoff.

551. (1) **Lattice Models I.**—Replacement of two and three dimensional elastic members by lattice work of one dimensional elements; plane stress and plane strain; types of cells; effect of Poisson's ratio; solution of lattice work; conversion of stresses. Mr. Hrennikoff.

552. (1) **Lattice Models II.**—Bending of plates by lattice method; types of cells for different Poisson's ratios; solution of lattice work and conversion of stresses. Application to cylindrical and other shells. (Prerequisite: C.E. 551.) Mr. Hrennikoff.

553. (1½) **Theory of Plates.**—A study of stress distribution in flat plates by Fourier Analysis, finite differences, models, and the stiffness matrix approximation. Stability of compressed plates. Textbook: Timoshenko and Woinowsky-Kreiger, *Theory of Plates and Shells*. Mr. Hooley.

554. (1½) **Theory of Shells.**—A study of the stress distribution and stability of various shell forms. Textbook: Flugge, *Stresses in Shells*. Mr. Hooley.

555. (1) **Energy Theorems of Structural Mechanics.**—Configuration space; generalized co-ordinates; holonomic and non-holonomic systems. Virtual work, virtual displacements; Fourier's inequality; stationary potential energy principle; Lagrangian multipliers; equilibrium; stability of equilibrium; matrix formulation of energy theorems. Canonical forms; generalized forms of Castigliano theorems; theorems of complementary energy. Calculus of variations. Variational theorem for mixed boundary value problems. Mr. Finn.

556. (1) **Elasticity and Visco-elasticity.**—Introduction to linear theories of elasticity and visco-elasticity and their application to engineering problems; stress and displacement fields; creep; stress relaxation; visco-elastic models; transformation of visco-elastic problems to avail of existing elastic solutions; solution inversion. Mr. Finn.

557. (1) **Numerical Procedures in Structural Analysis.**—Numerical and approximate methods for the solution of complex problems with wide application to engineering structures; moments and deflections of beams and beam-columns, moments and deflections of beams on elastic supports, critical buckling loads of bars of variable cross section loaded in various ways, vibrations of elastically supported mass systems. Mr. Cherry.

558. (1½) **Inelastic Bending & Plastic Design I.**—Stresses and deformations in beams beyond the elastic limit; limit design; rigid plastic theory and its theorems; non-rigid plastic theory; plastic analysis by the mechanisms method; plastic moment distribution; deflections; effect of normal load and shear. Mr. Hrennikoff.

559. (1½) **Inelastic Bending & Plastic Design II.**—Repeated loading; alternating plasticity and incremental failure; shakedown. Exact theory of inelastic bending. Non-rigid plastic theory; English and American approaches; beam-columns; design of individual members and connections. Weaknesses of plastic theory. (Prereq. C.E. 558.) Mr. Hrennikoff.

560. (1) **Hydraulic Engineering for Rivers, Harbours & Coasts.**—Mobile-boundary flow in sediment-bearing alluvial channels, and the laws relating to the geometry of their self formation. River morphology and sediment transport. Channel-bed scour at obstructions. River training and development for navigation. Coastal protection. Water waves and tides. Behaviour of tidal estuaries. Harbour planning and protection. Use of scale models. Mr. Pretious.

561. (1) **Unsteady Flow in Closed Conduits I.**—Analyses of water hammer in penstocks and in pump discharge lines; influence of friction; optimum gate closure. Mr. Ruus.

562. (1) **Unsteady Flow in Closed Conduits II.**—A study of various single and multiple surge tanks by analytical, graphical and numerical methods; stability. Mr. Ruus.

563. (1) **Open-channel Hydraulics.**—Advanced topics in steady flow; surge waves in power canals, in locks and navigation canals; flood routing. Mr. Ruus.

564. (1) **Hydrology I.**—Introduction, weather, rainfall and measurements, snow and snow survey, ice and glaciers, streamflow, evaporation and transpiration, ground water, sedimentation as applicable to hydrology. Textbook: Linsley, Kohler and Paulhus, *Hydrology for Engineers*. Mr. Singh.

565. (1½) **Hydraulic Structures.**—Requirements, limiting criteria, performance and design problems of dams and embankments; external load systems, foundations and form of dams vs. performance; hydraulic economic and construction problems; current theories, practice and potential developments. Mr. Wisnicki.

566. (1) **Governing of Hydraulic Turbines.**—Speed regulation of hydraulic turbines. Analyses of speed rise and analyses of turbine governing stability. (Prerequisite: C.E. 561.) Mr. Ruus.

567. (1) **Advanced Fluid Mechanics I.**—Basic hydrodynamics of viscous and non-viscous incompressible fluid flow: boundary layer theory, conformal transformation, lift and drag and simple applications of these theories. Mr. Singh.

568. (1) **Advanced Fluid Mechanics II.**—Free surface waves, tidal theory and estuary resonance. An introduction to turbulence theory. Interaction of fluids and structures. (Prereq. C.E. 567.) Mr. Singh.

569. (1) **Hydrology II.**—Infiltration, runoff relations, hydrographs, stream-flow routing, statistical hydrology, applications of hydrologic techniques. (Prerequisite: C.E. 564.) Mr. Singh.

570. (1) **Advanced Reinforced Concrete Design.**—Elastic and plastic deformations in reinforced concrete, torsional stresses in beams, ultimate load design. Mr. Lipson.

571. (1) **Prestressed Concrete.**—Design and analysis for flexure and shear, losses in prestress, anchorage zone stresses, deflections, composite beams, statically indeterminate beams. Mr. Lipson.

572. (1) **Concrete Technology.**—A study of cement, aggregates and other concrete materials; mix design methods; control and testing; a review of current literature on concrete with regard to strength, workability, volume change, durability, porosity and permeability. Mr. Heslop.

573. (1) **Yield Line Theory of Concrete Slabs.**—Stress-strain relation in concrete; ultimate strength of reinforced concrete beams; yield line formation; distributed and concentrated loads; solution by statics and virtual work. Mr. Hrennikoff.

580. (1) **Vibrations of Structures, I.**—Fundamental analysis for the behaviour of structures and structural elements subjected to dynamic loading; free and forced vibrations and transient response of structures treated as lumped and distributed parameter systems. Mr. Cherry.

581. (1) **Vibrations of Structures, II.**—Vibrations of frame and multi-storey buildings, bridges, cables, beams, columns and plates; propagation of stress waves in elastic solids; approximate and numerical methods for evaluating dynamic structural response. (Prereq. C.E. 580.) Mr. Cherry.

582. (1) **Fundamentals of Matrix Structural Analysis.**—Introduction to stiffness and flexibility influence coefficients; member stiffness and flexibility equations; orthogonal transformations; stiffness matrix of the main structure; computer application of the matrix methods to plane frame analysis. Mr. Tezcan.

583. (1) **Applications of Matrix Structural Analysis.**—The design of general matrix programmes for use on a digital computer and their application in calculating the stress resultants in various structures, plates, and shells. (Prereq. C.E. 582.) Mr. Hooley.

584. (1) **Fortran Programming and Advanced Topics in Structure.**—The programming techniques for stiffness analysis of structures; treatment of special cases; large structures; complete automation; space frames; input, computation and output phases; finite element approach for the analysis of plates and shells; demonstration and discussion. (Prereq. C.E. 582.) Mr. Tezcan.

585. (1) **Structural Theory.**—Selected topics in classical structural analysis. Mr. Hooley.

586. (1) **Non-Linear Structures.**—Analysis of non-linear structures such as arches, suspension bridges, and guyed towers. Mr. Hooley.

590. (1) **Soil Mechanics I.**—Basic soil properties; classification; subsurface exploration; permeability; capillarity; seepage; flow nets; compression and consolidation; stresses in soil. Mr. Finn.

591. (1) **Soil Mechanics II.**—Settlement analysis; strength theory; direct and triaxial shear machines; stability of slopes; lateral pressure and retaining walls; application of soil mechanics to dams; bearing capacity of soil. (Prereq. C.E. 590.) Mr. Finn.

592. (1) **Soil Engineering for Transportation Facilities.**—Colloid theory and base exchange phenomena; structure and stability of compacted soils; compaction; swelling of soils, influence of compaction methods on swelling and stability; effect of repeated loadings on clay soils; resilience; rheological properties of clays; evaluation of subgrades and bases by empirical and rational methods; soil stabilization. Mr. Campanella.

593. (1) **Advanced Topics in Soil Mechanics.**—Stress distributions in soil masses under various boundary conditions; soil dynamics; wave types; wave transmission characteristics; dynamic response; correlation of response with engineering properties; foundation design for dynamic loads; general plastic theory of equilibrium; stability according to various criteria. (Prereq. C.E. 590, C.E. 591, or equivalent.) Mr. Finn.

594. (1) **Principles of Pavement Design.**—The application of soil mechanics to the design of flexible and rigid highway and airport pavements. Limitations of the various design methods now in general use and of the ways of evaluating soil strength and controlling construction. Textbook: Yoder, *Principles of Pavement Design*. Mr. Heslop.

595. (1) **Geometric Design of Highways.**—Traffic capacity and geometric design of rural highways, arterial highways in urban areas, intersections at grade and grade separation interchanges. Mr. Peebles.

596. (1½) **Geometric Geodesy I.**—Geometry of the spheroid; computation of position on spheroidal surfaces; relation between geoid and spheroid; Laplace correction; Legendre's theorem; geodetic levelling. Textbooks: Clark, *Plane and Geodetic Surveying*, Vol. II.: Bomford, *Geodesy*. Mr. Bell.

597. (1½) **Geometric Geodesy II.**—Geodetic triangulation, trilateration, traversing and base measurements; least square adjustment of observations; mathematics of map projections. Textbooks: Clark, *Plane and Geodetic Surveying*, Vol. II.: Bomford, *Geodesy*. (Prereq. C.E. 596.) Mr. Bell.

598. (½-3) **Topics in Civil Engineering.**—Lectures and readings on specialized topics of current interest in the field of civil engineering. To be given on approval of the Head of the Department.

599. Thesis.—For the M.A.Sc. degree. (3 or 6 units.)

699. Thesis.—For the Ph.D. degree.

Electrical Engineering—Ph.D. and M.A.Sc. degrees

Prerequisites—Graduation in Electrical Engineering, Engineering Physics, Honours Physics and Honours Math-Physics. Students, particularly those in the Honours courses, may be required to supplement their graduate studies by taking certain undergraduate courses in Electrical Engineering.

Facilities are provided for research in: adaptive and optimal control systems, analogue, digital, hybrid computers and their applications, applied network theory, communications, electronic circuits, medical electronics, microwave electronics and plasmas, non-linear systems, power systems and energy conversion, scattering of electromagnetic waves, signal processing and solid state electronics.

M.A.Sc. Degree:

Prerequisites—Graduation in Electrical Engineering or Engineering Physics.

Course—Includes a thesis and at least 12 units of approved courses, 6 units of which must be at the graduate level within the Department and 3 units in other Departments.

Ph.D. Degree:

Facilities are provided for research and study in: power systems, communications, control systems, energy conversion, non-linear systems, electronic circuits, medical electronics, thin-film electronics, microwave, network theory, and computers.

Students should consult the Department for information regarding courses to be offered in 1966-67.

551. (2) **Applied Electromagnetic Theory.**—Basic relations, concepts and theorems; Green's functions; transverse electromagnetic waves; transmission lines, cylindrical and surface waveguides; problems involving plane-wave, cylindrical-wave and spherical-wave functions; perturbational and variational techniques and applications; radiation.

553. (2) **Electric Power Systems.**—The theory of energy flow, electrically long transmission lines, generalized circuit constants and graphical analyses. Synchronous machines as elements of a power system, stability and surge phenomena. Special problems of extra high voltage transmission. Computer studies of power systems.

557. (2) **Non-linear Systems.**—Analytical and graphical techniques applied to non-linear and time-varying systems. Stability via Liapunov's Direct Method. Applications to engineering problems.

559. (1) **Electronic Instrumentation.**—Theory and design of pulse circuits for generating, amplifying and measuring non-sinusoidal wave forms; applications in communication, instrumentation and control. Textbook: Millman and Taub, *Pulse and Digital Circuits*.

561. (2) **Network Theory.**—Analysis and synthesis of linear electrical networks.

563. (2) **Theory of Automatic Control.**—Linear feedback systems. Synthesis of optimum time-invariant linear systems. Theory of optimal control of linear and non-linear systems based on the principle of optimality and the calculus of variations.

565. (2) **Communication Theory.**—Axiomatic formulation of probability theory, random variables and functions of random variables, random processes; correlation functions and power density spectra, sampling theory, central limit theorem, Karhunen-Loève expansion, transmission of signals through linear and non-linear systems, optimum systems; introduction to coding theory and to the statistical theory of signal detection. An introduction to the statistical theory of communication; correlation methods for the detection of signals in noise; optimization of linear systems.

567. (1) **Analogue Computers.**—The electronic and electromechanical components used in analogue computation. Specialized circuitry and methods for function generation, multiplication and the solution of trigonometric problems. Various types of analogue computers and their applications in communications and control systems. Network analogues.

569. (2) **Logic Design.**—Representation of logic functions, use of Boolean algebra, systematic simplification of expressions, realization by electronic circuits, Sequential machines, state reduction, state assignments. Selected problems on logic design.

571. (1-2) **Electrical Engineering Seminar and Special Problems.**

573. (2) **Design of Electric Machines.**—Advanced course in machine design. General relations and their applications to specific types of machines using digital and analogue methods.

577. (2) **Matrix Analysis of Electrical Machines.**—Tensor concepts applied to electrical engineering problems; the theory of generalized machines; coordinate transformations for various reference frames; the analysis of power and control machines; the synchronous machine and power system problems.

579. (1) **Solid-State Electronics.**—Theory and measurement of simplifying properties and noise performance of parametric amplifiers, tunnel diodes, masers, lasers and other solid-state devices of current interest.

581. (2) **Electrodynamics.**—Field tensors; Maxwell's equations and relativity theory; electron ballistics using Lagrangian and Hamiltonian mechanics; space-charge waves in electron beams; Cherenkov radiation.

583. (2) **Microwave Measurements and Techniques.**—Theory and techniques for the measurement of wavelength and frequency, impedance, attenuation, Q-factor, power, receiver and transmitter characteristics, antenna characteristics and properties of materials.

585. (2) **Antennas and Radio Propagation.**—Elementary dipole and loop antennas. Parabolic and other reflectors. Antenna arrays. Interferometer techniques. Noise temperature of antennas. Propagation of radio waves. Applications to broadcasting, microwave links, satellite communications, and radio astronomy.

587. (2) **Thin Film and Solid-State Electronic Devices.**—Theory of electronic states and conductivity in semiconductors. Defects in crystals and ionic transport processes. Technique of thin films. Fabrication and theory of operation of various solid state devices. Integrated and thin film circuitry.

591. (2) **Engineering Applications of Analogue and Hybrid Computers.**—Programming of system equations, time and amplitude scaling, optimization techniques, partial differential equations, application to the study of control systems.

593. (1) **Instrumentation for Radio-Astronomy.**—Dish antennas and antenna arrays. Interferometers. Aperture synthesis and supersynthesis. Low-noise preamplifiers. Multi-channel receivers. Smoothing and data reduction. This course complements Physics 570, which deals with observations and theories resulting from radio-astronomical work.

599. Thesis.—For the M.A.Sc. degree.

699. Thesis.—For the Ph.D. degree.

Engineering Physics—M.A.Sc. degree

Prerequisite: Graduation in Engineering Physics or Electrical Engineering.

M.A.Sc. course includes Thesis, counting at least 3 units, at least 6 units chosen from graduate courses in the Department, and other approved courses. (*For doctoral studies see Science.*)

599. Thesis.—For M.A.Sc. degree.

Geological Engineering—M.A.Sc. degree

Prerequisite: Graduation in Mining or Geological Engineering.

M.A.Sc. courses includes Thesis, counting at least 3 units, Geology 504, Geology 545, the required courses in the chosen option and other approved courses. (*For doctoral studies see Science.*)

Mechanical Engineering—Ph.D. and M.A.Sc. degrees

M.A.Sc. degree:

Prerequisite — Graduation in Mechanical Engineering or Engineering Physics.

Course—Includes at least 6 units chosen from graduate courses in the Department, and other approved courses.

Ph.D. degree:

Facilities are provided for research and study in the field of Mechanical Engineering with concentration in the following areas:

- (a) Applied Mechanics.
- (b) Aerodynamics, Aeroelasticity and Space Dynamics.
- (c) Thermodynamics and Heat Transfer.

Students should consult the department for courses to be offered in the 1966-67 session since not all courses will be available.

550. **Special Advanced Courses**—Special advanced courses may be arranged for a graduate student upon the approval of the Head of the Department. The credit will not be for more than 3 units in any one such course.

560. (3) **Experimental Stress Analysis.**—Review of stress-strain formulations and techniques for solving equations of elasticity, computer and numerical methods, physical methods, brittle lacquer techniques, grid and moiré methods, two dimensional photoelasticity, photoelastic coatings, three dimensional methods, point-wise strain and displacement measurement techniques, rosette calculations, recording instruments. Laboratory (limited). Textbook: *Experimental Stress Analysis*, J. W. Dally and W. F. Riley, McGraw-Hill, April, 1965.

561. (3) **Applied Elasticity.**—Analysis of stress and strain in three dimensions; plane stress and plane strain; photoelasticity; torsion; energy methods of stress analysis; bending and buckling of rods; bending of plates; stresses in thin shells. Textbook: Wang, *Applied Elasticity*.

562. (1) **Introduction to Continuum Mechanics.**—Cartesian tensors, transformation and invariants of stress and strain, equations of motion and equilibrium, boundary conditions, constitutive equations for elastic, viscous and viscoelastic substances, plastic yield conditions and associated flow rules.

563. (2) **Lubrication.**—Physical properties of lubricants; basic hydrodynamic theory applicable to lubrication problems; plane sliding bearings; journal bearings subjected to steady and dynamic loads; theory of rolling bearings; boundary lubrication; mechanism of metallic friction; the nature of metallic wear.

564. (3) **Space Dynamics I.**—Dynamics of systems with variable mass; introduction to relativistic mechanics; rectilinear motion of a rocket; ascent to the moon; orbital mechanics; transfer of orbit; estimation of life time; gyro-dynamics; theory of stabilized platforms; inertial guidance; performance and stability of space vehicles.

565. (2) **Advanced Mechanical Vibration.**—Close and far coupled multiple degree of freedom systems, matrix methods, energy methods, vibration of beams, membranes and plates.

566. (2) **Dynamics of Automatic Control.**—Linear servo-systems; transient and steady state behaviours; frequency response; the root locus method; lag correction and stabilization; multiple loop systems; synthesis; non-linear control.

567. (1) **Engineering Rheology.**—Rheological kinematics and dynamics; the basic equations of elasticity; the Pascalian liquid; the Hookean solid; the Newtonian liquid; Navier-Stokes equations; viscosity; the Maxwell Liquid; creep; the Kelvin body; macro and micro-rheology; plastic flow; the St. Venant body; the Mises-Hencky flow condition; the Bingham body and generalized bodies.

568. (1) **Theory of Plasticity.**—Selected problems in the theory of plasticity, thick walled cylinders and spheres, torsion, slip-line fields, indentation, drawing and extrusion. Prerequisite: M.E. 562.

569. (2) **Non-Linear Vibration.**—Phase plane representation, singular points, exact solutions, equivalent linearization, perturbation method, averaging method, variation of parameters, forced vibration, self-excited vibration.

570. (3) **Space Dynamics II.**—Dynamics of single and multistage rocket, optimization of rocket performance, geometry or spatial orbit, orbit determination using Gauss, Laplace, and Gibbs method, orbit perturbations and Hansen's method, optimum orbital transfer and rendezvous, active and passive stabilization of space vehicle, introduction to three body problem.

572. (3) **Convection Heat Transfer.**—Governing equations for laminar and turbulent flow. Forced convection in internal and external flow. Free and combined free and forced convection. Heat transfer at high velocities, in rarefied gases and in two-phase flow. Heat exchangers. Mass transfer.

573. (1½) **Radiation Heat Transfer.**—Monochromatic and goniometric surface properties. Energy exchange of grey, non-grey, diffuse, directional or specular surfaces. Absorption coefficient and radiation intensity in gas radiation. Radiation between a gas and its enclosure. Radiation of luminous flames.

574. (1½) **Conduction Heat Transfer.**—Two and three dimensional steady and unsteady heat transfer. Analytical methods. Relaxation, graphical and analogue methods. Conduction with heat sources and sinks. Heat transfer with

variable thermal conductivity. Contact resistance. Moving boundaries. Extended surfaces, their applications and optimization. Experimental methods for determination of thermal conductivity of solids, liquids, and gases.

575. (3) **Advanced Topics in Momentum, Heat and Mass Transfer.**—Special topics in laminar boundary layer theory: arbitrary wall flux. The method of Lighthill; free convection; non-zero wall velocity. Asymptotic expansion—inner and outer solutions. Jets and wakes. Condensation with non-zero interfacial shear. Boiling. Non-Newtonian boundary layer theory: examples.

581. (3) **Theory of Ideal Fluids.**—Topics selected from the kinematics and dynamics of inviscid incompressible fluids in steady and non-steady motion; two-dimensional and axisymmetric potential flows; applications of conformal mapping; Stokes stream function; free streamline flows; vortex motions; non-steady airfoil theory.

582. (3) **Theory of Real Fluids.**—Navier-Stokes equations and exact solutions; boundary layer equations and exact and approximate methods for laminar flow; three-dimensional and non-steady cases; compressible laminar boundary layers; stability of laminar flow and transition; momentum and energy equations for turbulent shear flow; velocity defect law; experimental techniques; free shear turbulent flows; boundary layer control. Text: *Boundary Layer Theory*, H. Schlichting, McGraw-Hill, 1961.

583. (3) **High Speed Gas Dynamics.**—Topics selected from the dynamics of a gas considered mainly as a non-heat-conducting inviscid continuum; acoustic small-disturbance equations; initial and boundary value problems of wave propagation; applications to airfoils and wings at high speed; conical flow; slender body theory; characteristics theory; hodograph methods; shock and blast waves; similarity methods; hypersonic flow theory.

584. (2) **Mechanics of Rarefied Gases.**—The flow of a rarefied gas in terms of kinetic theory. A review of classical statistical mechanics. Free molecule flow. The Boltzmann equation applied to non-equilibrium flows.

585. (3) **Aeroelasticity.**—Idealization of elastic systems; elastic axis; influence coefficients; coupled and uncoupled modes of vibration; unsteady aerodynamics; static aeroelastic phenomena; two dimensional and three dimensional flutter theory; solution of flutter stability determinant; buffeting and stall flutter; aspect ratio and compressibility effects; flutter model and testing technique.

598. (1) **Seminar.**—Presentation and discussion of current topics in mechanical engineering research.

599. **Thesis.**—For the M.A.Sc. degree.

699. **Thesis.**—For the Ph.D. degree.

Metallurgical Engineering.—M.A.Sc. degree

Prerequisite: Graduation in Metallurgical, Chemical, Mechanical Engineering, or Engineering Physics.

M.A.Sc. course includes at least 3 units chosen from courses numbered 500 in Metallurgy, and other approved courses.

Metallurgy—M.Sc. and Ph.D. degrees*M.Sc. Degree:*

Prerequisites: Honours in Physics, Chemistry or equivalent.

M.Sc. course includes Thesis counting normally 6 units; 3 units selected from courses numbered 500 in Metallurgy; and at least 3 units from courses numbered 500 in Chemistry or Physics.

550. (2) **Metallurgical Thermodynamics**—Application of advanced thermodynamic principles in metallurgical processes. Mr. Samis.

552. (1) **Metallurgical Kinetics**—Application of chemical reaction rate theory to metallurgical processes. Mr. Peters.

554. (1) **Hydrometallurgy**—Modern theories of comminution, leaching, purification and precipitation processes. Staff.

560. (1) **Metallurgy of the Rarer Metals**—Principles, practices, and research trends in the extractive metallurgy of rarer metals. Mr. Peters.

561. (1) **Nuclear Metallurgy**—Survey of principles of reactor operation; metallurgical aspects of fuels, constructional materials, radiation damage, corrosion. Mr. Armstrong.

570. (2) **Structure of Metals III**—Nature and properties of lattice imperfections; dislocation theory and its use to describe work hardening, creep, structure of grain boundaries and other phenomena. Mr. Teghtsoonian.

572. (2) **Advanced Physical Metallurgy**—Solidification and crystal growth; zone refining; nucleation theory; eutectoid decomposition; age hardening; recrystallization and grain growth; martensitic transformations; order-disorder transformations. Staff.

574. (1) **Topics in Physical Metallurgy**—Topics of metallurgical interest in the field of physical metallurgy to be selected for discussion. Staff.

576. (1) **Diffusion I**—Mathematical analysis; Kirkendall effect; mechanisms; theories of self-diffusion and chemical diffusion; grain-boundary and surface effects; theory of sintering. Mr. Brown.

580. (1) **Metal Fabrication II**—Current research and analysis of metal fabricating processes such as casting, metal forming, and powder metallurgy. Mr. Lund.

581. (1) **Sintering Theory**—Driving force for sintering; theory of sintering in the solid state, and in the presence of a liquid phase; current theory of hot pressing and reactive hot pressing. Mr. Chaklader.

582. (1) **Advanced Ceramics**—Complex silicate structures; ion exchange in silicates; kinetics of solid state reactors; kinetics of high temperature processes. Mr. Chaklader.

584. (1) **Advanced X-Ray Diffraction**—Reciprocal lattice; dislocations and stacking faults; Fourier analysis; microbeam analysis; small angle scattering; applications in physical problems. Mr. Teghtsoonian.

586. (1) **Electron Microscopy**—A basic course on the theory and practice of electron microscopy with emphasis on transmission microscopy. Mr. Tromans.

588. (2) **Physical Metallurgy**—Topics covered will include dislocation theory, diffusion, solidification, nucleation theory and structure of liquids. Staff.

592. (1-3) **Special Topics in Metallurgy.**—A special advanced course may be arranged on approval of the Head of the Department.

598. **Research Conference.**—A required course for all graduate students in Metallurgy or Metallurgical Engineering, in which current research projects will be discussed. The course carries no academic credit.

599. (6) **Thesis.**—For M.A.Sc. and M.Sc. Degrees—Research studies in chemical metallurgy, physical metallurgy, or ceramics.

699. **Thesis.**—For Ph.D. Degree.

Ph.D. Degree

Department provides facilities for research studies in:

Hydrometallurgy: pressure oxidation and reduction reactions, electrode processes, corrosion.

Pyrometallurgy: thermodynamic and ionic equilibria in slags and fused salts, slag-metal equilibria and thermodynamic properties of metal solutions.

Physical Metallurgy: deformation of single crystals, dislocation mechanics, diffusion and transformations, electron microscopy.

Mechanical Metallurgy: properties of refractory metals, dispersion hardening, composite structures, fine particle strengthening.

Ceramics: creep in refractory oxides, metal ceramic systems, solid state transitions.

Mineral Engineering—M.A.Sc. and Ph.D. degrees

M.A.Sc. Degree:

Prerequisite—Graduation in Mineral or Geological Engineering.

Course—Includes at least 3 units chosen from graduate courses in the Department of Mineral Engineering and other approved courses.

Ph.D. Degree:

The Department provides facilities for research studies in the following fields: (a) rock mechanics, (b) mining systems and operations research, (c) mineral dressing.

550. (1) **Mining Methods.**—A more advanced study of some aspects of mining methods. Mr. Crouch.

551. (2) **Rock Mechanics.**—Rheology and its mathematical development, testing rocks in the laboratory, testing rocks in situ, mine and excavation geometry, design of rock structures, special supports. Mr. Emery.

552. (2) **Applied Physical Measurements.**—Theory of elasticity, measurement theory and data analysis, measurement techniques and their application in experimental situations. Photoelastic, strain gauge, hydraulic, sonic devices; gravimetric, magnetic, temperature and other measurements. Mr. Emery.

553. (2) **Operations Research.**—Production engineering, linear programming, queuing theory and applications, simulation, reliability theory, game theory, dynamic programming. Mr. Emery.

570. (2) **Theory of Fine Particles.**—Measurement of particle size and surface area; physical and chemical behaviour of fine particles; methods of separation; settling; filtration; use of electrolytes; effect of slime coatings. Reference: Dalla Valle, *Micrometrics*, 2nd edition. Mr. Howard.

571. (2) Properties of Interfaces.—Physical and chemical adsorption at various interfaces; thermodynamic models of adsorption isotherms; surfactants, insoluble monolayers, interactions at interfaces and synergistic effects; electrical effects at interfaces. Applications: flotation, corrosion, emulsification, detergency, lubrication. Mr. Leja.

590. (1-3) Special Advanced Topics.—A special advanced course may be arranged upon the approval of the Head of the Department .

598. (1) Seminar.—Presentation and discussion of current topics in mineral engineering research. Attendance of all students proceeding to graduate degrees in the Department is required during each year of residence.

599. Thesis.—For M.A.Sc. Degree. Research studies in mining or mineral dressing.

699. Thesis.—For Ph.D. Degree.

1966-67

ARCHITECTURE

The School of Architecture offers opportunities for graduate work leading to the Master of Architecture degree in three major areas: (a) Theory of Design; (b) Housing; (c) Structures. The candidate will select one of these.

Prerequisites: Graduation in Architecture, and at least one year in the offices of architects or the equivalent.

M.Arch. Course: Thesis, counting at least 3 units, Architecture 500, and courses in Architecture and related fields selected in consultation with faculty advisers.

500. (3) **Advanced Design.**—Design project chosen by the student in consultation with the professor in charge. Project to explore the design implications within the student's programme. Staff of School and visiting critics.

503. (3) **Theory of Design.**—The exploration and analysis of theories and philosophies of architecture and design and the ways in which they affect architectural form. Mr. Rogatnick.

504. (3) **Housing Design.**—Elements of dwelling design, the design of building groups, landscaping and design of surrounding areas; lectures, seminars, and analyses. Mr. Gerson and Dr. Oberlander.

505. (3) **Form Related to Structure.**—Relationship between form and structural performance; significant loads and stresses; arch, vault, shell, membrane and space lattice effects of materials and technology; historical survey and possibilities of development. Mr. Wisnicki.

549. (3) **Thesis for Master's Degree.**

ARTS

The degree of Doctor of Philosophy is offered in Anthropology and Sociology, Classics, Economics, English, Geography, German, History, Philosophy, Political Science, Psychology and Romance Studies.

The degree of Master of Arts is offered in each of the departments listed below.

Anthropology—Ph.D. and M.A.

The Department offers studies leading to the M.A. and the Ph.D. in several fields within Anthropology and Sociology. These include (1) socialization and social control, (2) ethnography of South Asia and North America, kinship and political organization, (3) experimental and interactional studies, (4) complex organizations and group-processes and (5) comparative institutions and socio-economic changes.

500. (1-3) **Advanced Theory.**—A systematic review of contemporary theory in cultural and social anthropology.

501. (1-3) **Social Structure and Kinship.**—The advanced comparative study of social structure and kinship.

502. (1-3) **Advanced Ethnography of a Special Area.**

503. (1-3) **Social Control.**

504. (1-3) **Tribal and Peasant Economic Systems.**

505. (1-3) **Religion and Society.**

511. (1-3) **Personality and Culture.**—Relationships between the individual and social process; social and cultural determinants; applications in community-development and other programmes.

512. (1-3) **Language and Culture.**—Relationships of language, culture and society.

520. (1-3) **Advanced Prehistory of a Special Area.**

530. (1-3) **Social Change.**—An advanced study of the theory of social change.

531. (1-3) **The Anthropology of Development.**

532. (1-3) **Field Methods.**

534. (1-3) **Special Advanced Courses.**

540. (3) **Advanced Seminar.**

549. (3-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Asian Studies—M.A.

Prerequisite: graduation in an Honours Programme or with a major and additional units, including two years of Chinese or Japanese or another language acceptable to the Department.

509. (3) **Problems of Modernization in Eastern and Southern Asia.**

510. (3) **Readings in Chinese Literature and Linguistics.**

511. (3) **Readings in Japanese Literature.**

512. (3) **Seminar. Topics in Chinese History and Institutions.**

513. (3) **Seminar on Problems of Japanese Intellectual History.**

514. (3) **Seminar on Problems of Indian History Since 1858.**

525. (3) **Seminar. Topics in Asian History or Literature.**

549. (3-6) **Master's Thesis.**

Classics—Ph.D. and M.A.

The Department will accept candidates for the Ph.D. who wish to specialize in certain fields of Classical Antiquity (e.g., Greek History, Roman History, some phases of Greek and Roman Literature).

The thesis for the M.A. may be written in the field of Greek Language and Literature, or Latin Language and Literature, or Greek History or Roman History, or Greek Archaeology.

Greek

- 521. (3) Aristotle's *Politics*.
- 522. (3) Homer and the Epic.
- 523. (3) Plato.
- 524. (3) The Tragic Poets.
- 525. (3) Thucydides.
- 535. (3) Problems in Greek History.
- 536. (3) The Monuments and Topography of Athens.
- 545. (3) Greek Epigraphy.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

Latin

- 521. (3) Cicero, Letters.
- 522. (3) Roman Elegiac Poetry.—The genesis of the Roman Elegy from its Greek models; a study of the works of Catullus, Tibullus, Propertius and Ovid.
- 523. (3) Roman Comedy.
- 530. (3) The Roman Historians.
- 531. (3) The Roman Epic.
- 535. (3) Problems in Roman History.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

Comparative Literature

533. (3) Epic Poetry.—The nature and tradition of epic poetry, with particular emphasis on Homer, Vergil and Milton. Comparative studies will also be made of *Beowulf*, the *Chanson de Roland* and the *Nibelungenlied*.

For Seminar in Comparative Dramatic Literature, See Theatre 510, p. O46.

Creative Writing

The Department offers the following opportunities for advanced studies in the writing of poetry, fiction and drama; M.A. in Creative Writing; inter-departmental M.A. in Creative Writing and Theatre. The latter is designed for advanced playwrights who must be accepted by both departments on the basis of work submitted. With the consent of the Departments of English and Creative Writing a graduate student in English may submit a creative work (poems, fiction, drama) in place of a thesis.

507. (3) Advanced Writing of Drama.—Workshop in the writing of stage, screen, television, and radio plays. Studio work may be required, and some stage plays may be given workshop production.

509. (3) Advanced Writing of Fiction.—Workshop in the writing of the short story, novella and novel.

510. (3) **Writing of Poetry.**—Workshop in the writing of poetry.

547. (up to 4 units) **Directed Reading.**—A course designed according to the needs of the individual student, dealing with literary genres on which he is not concentrating, as well as works from related fields such as Philosophy, Fine Arts, etc.

549. (3) **Thesis.**—With the consent of the Departments of English and Creative Writing, a student may submit a creative work (poems, fiction, drama) in place of the thesis in English. The candidates should enrol in Creative Writing 549 instead of English 549.

Economics—Ph.D. and M.A.

500. (3) **Economic Theory.**—Theories of value and distribution; general and partial equilibrium; welfare-economics: theory of money and employment; fluctuations in growth.

502. (3) **International Trade.**—Development of the theory of international trade; the theory of tariffs; customs unions and free-trade areas; the theory of payments and applications to current problems.

503. (3) **History of Economic Analysis.**—The analytical foundations of modern economic theory; a critical examination of the great systems of economic thought; the spread of economic ideas, especially to the New World; the impact of environment on economic thought.

504. (3) **Applied Statistics and Econometrics.**—Quantitative techniques used in economic research and their applications.

505. (3) **Sample Survey Methods and Theory.**—A two-part course. Part I will deal with methods and Part II with theory of simple random, stratified, cluster and multistage sampling.

506. (3) **The Economics of Income-Security.**—An analysis of Canadian, British and American experience in dealing with problems of income-security arising from unemployment, sickness, disability, poverty and old age. Implications of this experience for taxation and fiscal policy.

507. (3) **Economics of Labour.**—Wage theory; determinants of wage rates in organized and unorganized labour markets; collective bargaining and industrial conflict; impact of union policies on general economic stability and economic growth.

508. (3) **Money and Banking.**—Basic theory of money and the banking mechanism; nature of credit; the determinants of interest rates, employment and the general price level; central banking in theory and practice.

509. (3) **Economic Analysis and Natural Resources.**—Application of economic theory to the use of natural resources; management of particular resources; analysis of public policies.

510. (3) **Governmental Finance.**—Determination of level and type of public expenditures. Influence of governmental expenditures and method of raising revenue on allocation of resources, economic growth and economic stability. Dominion-provincial-municipal financial relations. Management of debt. The budgeting process.

511. (3) **Industrial Structure and Public Policy.**—The market behaviour of certain monopolistic and competitive industries; regulation of restrictive practices by government.

512. (3) **Economic Development.**—A study of some underdeveloped areas with particular attention to their financial problems.

515. (3) **Mathematical Economics.**—Application of mathematical techniques to the solution of problems in economic theory.

520. (3) **Economic History.**—A seminar on critical periods and problems in the development of the Western world.

540. Seminar.

549. (1-6) Master's Thesis.

600. (3) **Topics in Economic Theory.**

604. (3) **Advanced Econometrics.**—Study of the theoretical basis of econometric methods and exploration of unsolved and controversial problems in econometrics.

607. (3) **Comparative Systems of Industrial Relations.**—Organization, structure and policies of labour movements and employer groups in major industrial countries; comparative analysis of collective bargaining and industrial conflict; labour and economic development.

608. (3) **Banking Processes and Policies.**—Structure and working of banking systems and money markets in Canada, the United Kingdom, the United States and other leading countries; methods of monetary expansion and contraction and of capital foundation; concepts and techniques of monetary policy and controls; current issues.

649. Ph.D. Thesis.

English—Ph.D. and M.A.

Ph.D.

The Department offers opportunities for advanced study in English, American, and Canadian Literature.

M.A.

Candidates must take an examination in the history of English literature and demonstrate an adequate reading knowledge of the foreign language offered.

501. (0-3) **Bibliography and Methods.**—Required of all graduate students lacking English 491.

503. (3) **Studies in Prose.**

504. (3) **Studies in Drama.**

505. (3) **Studies in Fiction.**

506. (3) **Studies in Poetry.**

507. (3) **Studies in Criticism.**

508. (3) **Studies in the History and Structure of the English Language.**

510. (3) **Old English Studies.**

512. (3) **Middle English Studies.**

515. (3) **Shakespeare.**

- 519. (3) Studies in Sixteenth Century.
- 520. (3) Studies in Seventeenth Century.
- 525. (3) Studies in Eighteenth Century.
- 530. (3) Studies in the Romantic Period.
- 535. (3) Studies in the Victorian Period.
- 539. (3) Studies in Twentieth Century.
- 540. (3) Studies in American Literature to 1890.
- 545. (3) Studies in American Literature since 1890.
- 547. (3) Directed reading in fields in which no courses are offered.
- 548. (3) Studies in Canadian Literature.
- 549. (3-6) Master's Thesis.

(With special permission from the Departments of English and Creative Writing a student may offer a creative work in place of the thesis. See Creative Writing 549.)

- 649. Ph.D. Thesis.

Fine Arts—M.A.

- 525. (3) Seminar in the History of Art.

526. (3) Criticism of Art.—An examination of the elements and forms of art criticism, with special reference to thought and writing on art from the Greeks to the present day.

- 531. (1-3) Directed Study in the Visual Arts.
- 541. (1-3) Special Advanced Courses.
- 549. (3-6) Master's Thesis.

French—Ph.D. and M.A.

Ph.D.

The Department of Romance Studies offers opportunities for advanced study in French Literature and French-Canadian Literature.

M.A.

- 500. (1) Bibliography.
- 501. (3) The Literature of Mediaeval France.
- 502. (3) Studies in Sixteenth-Century Literature.
- 503. (3) French Society in the Seventeenth Century.
- 504. (3) The Novel from 1600 to 1680.
- 505. (3) Studies in Seventeenth-Century Theatre.
- 506. (3) The Novel from 1680 to 1735.
- 507. (3) The French Enlightenment.
- 508. (3) Studies in French Romantic Literature.

- 509. (3) Studies in Nineteenth-Century Theatre.
- 510. (3) Modern Poetry from Baudelaire to the present.
- 511. (3) Contemporary French Literature.
- 512. (3) Studies in Literary Criticism.
- 513. (3) Problems in French-Canadian Literature.
- 514. (3) Problems relating to the French Novel.
- 515. (3) Romance Philology.
- 516. (3) History of the French Language.
- 520. (3) French Language and Literature.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

Geography—Ph.D. and M.A.

The Department offers opportunities for advanced study in geomorphology, economic, urban and cultural geography with regional interests in Western Canada (including the Western Arctic), the U.S.S.R., Latin America and East Asia.

Pro-Seminars

- 500. (1½) Physical Geography.
- 501. (1½) Economic Geography.
- 502. (1½) Cultural Geography.
- 503. (1½) Political Geography.

Courses and Seminars

- 510. (1½) Cartographic and Quantitative Analysis.
- 511. (1½) Quantitative Methods in Earth Sciences.
- 512. (1½) Techniques of Spatial Analysis.
- 513. (1½) Research Sources for Regional Study.
- 520. (1½) Quantitative and Dynamic Geomorphology.
- 521. (1½) Permafrost.
- 523. (1½) Climatology and Hydrology.
- 530. (1½) Economic Geography.
- 531. (1½) Urban Geography.
- 532. (1½) Political Geography.
- 533. (1½) Marginal Settlement.
- 534. (1½) Historical Geography.
- 538. (1½) History of Geographic Thought.
- 539. (1½) Contemporary Geographic Thought.
- 540. (1½-3) Geomorphology.
- 541. (1½-3) Manufacturing.
- 542. (1½-3) Urban Geography.
- 545. (1½-3) Canada.
- 546. (1½-3) Western Arctic.
- 547. (1½-3) China.
- 548. (1½-3) U.S.S.R.
- 550. (1½-3) Directed Reading.
- 599. (3-6) Master's Thesis.
- 699. Ph.D. Thesis.

German—Ph.D. and M.A.*Ph.D.*

The Department should be consulted about fields in which it is prepared to direct specialized research for the Ph.D.

M.A.

Candidates must take an examination in the history of German literature.

- 501. (3) Studies in the German Novel.
- 502. (3) History of the German Language.
- 503. (3) Seminar in Modern Authors.
- 504. (3) Studies in Mediaeval Literature.
- 505. (3) Studies in Expressionism.
- 506. (3) Old Icelandic.
- 507. (3) The German Essay from Lessing to Thomas Mann.
- 508. (3) Gothic and Comparative Germanic Linguistics.
- 509. (3) The Enlightenment.
- 510. (3) Studies in the Early Classical Period.
- 511. (3) Studies in the Later Classical Period.
- 512. (3) Studies in Romanticism.
- 513. (3) Seminar in Austrian Authors.
- 514. (3) Nineteenth-Century Realism.
- 515. (3) Contemporary Authors.
- 516. (3) Guided Research.
- 548. (1) Bibliography and Methods.
- 549. (3) Master's Thesis.
- 649. Ph.D. Thesis.

Greek—M.A. (see Classics)

Normally, the thesis will be written on a Greek subject and the degree will be taken in Classics.

History—Ph.D. and M.A.*Ph.D.*

The Department offers opportunities for advanced study in the fields of American, Canadian, British, European, and British Imperial and Commonwealth History.

M.A.

- 500. (3) Readings in History.
- 501. (3) Seminar in Historiography.
- 511-513. (3) Seminar in Mediaeval History.
- 517-519. (3) Seminar in Modern European History.
- 521-523. (3) Seminar in British History.
- 527-529. (3) Seminar in Imperial and Commonwealth History.
- 531-533. (3) Seminar in Canadian History.
- 537-539. (3) Seminar in American History.
- 541-543. (3) Seminar in Intellectual History.
- 549. (6) Master's Thesis.
- 649. Ph.D. Thesis.

Italian—M.A.

- 500. (3) Directed readings in Italian.
- 501. (3) Seminar on Dante.
- 549. (3-6) Master's Thesis.

Latin—M.A. (see Classics)

A knowledge of Greek will be required of all candidates.

Music—M.Mus.

The Master of Music degree is offered in the following areas: (1) Musicology; (2) Composition/Theory; (3) Performance; and (4) General Music.

Musicology

- 520. (4) Seminar in Musicology.
- 521. (3) Seminar in Performance-Practices OR
- 522. (3) Seminar in Polyphonic Notation.
- 549. (3) Thesis.

Composition/Theory

- 500. (4) Seminar in Analytical Techniques.
- 549. (3) Thesis or Recital.

Performance

- 528. (3) Seminar in Music Literature.
- 546. (3) Applied Music.
- 549. (3) Thesis Recital.

General Music

- 506. (4) Seminar in Conducting, Materials and Procedures.
- 549. (3) Thesis (including demonstration or recital).

Theory and Composition

- 500. (4) Seminar in Analytical Techniques.—Prerequisite: Music 400 or permission.
- 504. (3) Twentieth-Century Practices.—Prerequisite: Music 300.
- 506. (4) Seminar in Conducting, Materials and Procedures.—Prerequisite: Music 306.
- 509. (3) Advanced Orchestration and Arranging.—Prerequisite: Music 309.
- 549. (3) Master's Thesis.

History and Literature of Music

520. (4) **Seminar in Musicology.**—Prerequisites: Music 320 and a course in musical history numbered 300 or above.

521. (3) **Seminar in Performance-Practices.**—Prerequisites: Music 320 and a course in musical history numbered 300 or above.

522. (3) **Seminar in Notation of Polyphonic Music.**—Prerequisite: Music 320 and a course in musical history numbered 300 or above. (Students who have completed Music 425 should not enrol in this course.)

523. (3) **Seminar in Mediaeval Music.**—Prerequisite: Music 425.

524. (3) **Seminar in Music of the Renaissance.**—Prerequisite: Music 425.

525. (3) **Seminar in Baroque Music.**—Prerequisite: Music 323.

526. (3) **Seminar in Eighteenth-Century Music.**—Detailed study and investigations of the development of eighteenth-century music in such centres as Mannheim and Vienna. Prerequisite: Music 323.

527. (3) **Seminar in Nineteenth-Century Music.**—Designated projects relating to nineteenth-century musical developments. Prerequisite: Music 324.

528. (3) **Seminar in the Literature of Music.**—Students in graduate programmes involving performance will be given special projects related to the history, bibliography, repertoire, and teaching problems in each area. A paper will be required. Prerequisites: Music 300 and 320.

549. (3) **Master's Thesis.**

Applied Music

544. (1) **Private Applied.**—Private lessons in voice, piano and orchestral instruments; or in harpsichord, viol, recorder and other historical instruments. Two one-half hour lessons each week with suitable practice.

545. (2) **Private Applied.**—Same as Music 544 with additional practice.

546. (3) **Private Applied.**—Same as Music 545 with additional practice.

549. (3) **Master's Thesis.**—Recital.

Ensembles

550. (0) **University Symphonic Orchestra.**

551. (0) **University Chamber Orchestra.**

552. (0) **University Wind Ensembles.**

553. (0) **University Singers.**

554. (0) **University Choral Union.**

555. (0) **University Chamber Singers.**

556. (0) **Collegium Musicum Ensemble.**

560. (0) **String Chamber Ensembles.**

561. (0) **Piano Chamber Ensembles.**

Philosophy—Ph.D. and M.A.

The Department undertakes doctoral work in epistemology, metaphysics, ethics, aesthetics, political philosophy, logic, philosophy of science and philosophy of mathematics.

- 500. (3) Metaphysics-Epistemology.
- 501. (3) Moral Philosophy.
- 502. (3) Logic.
- 503. (3) Ancient Philosophy.
- 505. (3) Philosophy of Mathematics.
- 506. (3) Philosophy of Mind.
- 511. (3) Aesthetics.
- 513. (3) Mediaeval Philosophy.
- 514. (3) Philosophy of Science.
- 521. (3) Political Philosophy.
- 524. (3) Philosophy of Social Science.
- 573. (3) Plato.
- 583. (3) Aristotle.
- 593. (3) Kant.
- 539. (6) Problems.
- 549. (6) Master's Thesis.
- 649. Ph.D. Thesis.

Political Science—Ph.D. and M.A.

500. (3) **Political Theory.**—Interpretation of basic concepts in political theory; systems of thought of the great political thinkers and their application to modern political problems; methods in seeking generalizations from contemporary political phenomena; critical investigation of relevant ideas and methods from cognate disciplines; the broader approach in the study of politics; an appraisal of the function of the theorist in political science.

501. (3) **Seminar in Canadian Government and Politics.**—Selected aspects of Canadian government. The Canadian party system. Adjustment of federalism to the demands of cultural dualism and regional pressures. The Canadian bureaucracy. Government and economic regulation.

502. (3) **Public Administration.**—Group-values in administration, specialization and authority; communication; decision-making; the criterion of efficiency; responsibility and accountability; the search for principles of administration.

503. (3) **Techniques of Political Analysis and Research.**—Analysis of political documents; problems of classification and interpretation; techniques used for the analysis of the structure and behaviour of groups; ecological studies; random and empirical surveys; questionnaires, interviews, non-mathematical models, game-theory.

504. (3) **The Theory of International Relations.**—The development of international relations as a field of study; problems of theory-construction; the contributions of the social sciences to the study of international relations; current theoretical and empirical approaches to research, including decision-making, systemic analysis, conflict-studies, and game-theory.

505. (3) **Political Parties and Political Movements.**—The analysis of parties and movements with particular reference to membership, ideology, leader-

ship and electoral impact. Examples will be drawn primarily from North American politics, using the findings of both historical and contemporary empirical research.

506. (3) **Models of the Political System.**—Detailed analysis of research and models used to explain the political processes; elite, equilibrium and other systemic theories. Political opinion and propaganda; classical theories and behaviourist models; mass-media and the formation of public policy.

507. (3) **Comparative Western Government.**

508. (3) **Comparative Non-Western Governments.**

509. (3) **International Organization.**

510. (3) **Directed Studies.**

540. (3) **Seminar.**—An analysis of contemporary developments in political science with particular attention to empirical theories of a general and systemic nature.

549. (3-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Psychology—Ph.D. and M.A.

Ph.D.

The Department offers facilities for research in the following major fields: experimental psychology, social psychology, personality, abnormal psychology, developmental or child psychology and industrial psychology.

A candidate for the Ph.D. in the field of clinical psychology must spend at least one year of study in a clinical situation acceptable to the Department.

500. (3) **History of Psychology.**

501. (3) **Social Psychology.**

503. (3) **The Theory of Personality.**

504. (3) **Physiological Psychology.**

505. (3) **Psychometrics.**

506. (3) **Perceptual Processes.**

507. (3) **Cognitive Processes.**

508. (3) **Human Factors and Systems Research.**

510. (3) **Verbal Learning.**

511. (3) **Developmental Psychology.**

512. (3) **Advanced Methods in Research.**

515. (3) **Industrial Psychology.**

516. (3) **Advanced Experimental Psychology I.**—Advanced treatment of problems in sensory, perceptual and physiological factors in behaviour.

517. (3) **Advanced Experimental Psychology II.**—Advanced treatment of problems in learning, motivation, emotion and cognition.

518. (3) **Topics in the Dynamics of Behaviour.**

530. (3) **Principles and Techniques in the Evaluation of Personality Evaluation.**

- 540. (3) Principles and Techniques of Intellectual Assessment.
- 541. (3) Objective Tests in Diagnosis and Adjustment of Personality.
- 542. (3) Seminar in Clinical Psychology.
- 543. (3) Principles of Psychotherapy.
- 544. (3) Patterns of Child-Rearing.
- 545. (3) Advanced Statistics I.
- 546. (1-3) Seminar.
- 547. (1-3) Reading and Conference.
- 548. (1) Seminar.
- 549. (3-6) Master's Thesis.
- 649. Ph.D. Thesis.

Romance Studies—Ph.D. (see French)

- 1. Courses are offered in the fields of:
 - (a) French literature.
 - (b) French Canadian literature.
 - (c) Romance Studies.

- 2. Studies in cognate fields will be selected.

519. (3) **The Language and Literature of Old Provençal.**—A study of the principal literary works and the development of the language.

520. (3) **Studies in Romance Languages and Literature.**

Slavonic Studies—M.A.

502. (3) **Comparative Slavonic Philology, Part II.**—A further examination of morphemes, accentology and advanced studies in phonology and semantics.

504. (3) **Seminar in Russian History.**

505. (3) **Seminar in Soviet History.**

506. (3) **The Slavs in the Habsburg Monarchy, 1526-1918. Seminar.**—This course will deal with the various Slavonic nationalities of the Monarchy and will explore their national status and their movements for autonomy and independence. The emphasis will be on the period 1848-1914.

508. (3) **History of Russian Drama.**—From mid-eighteenth century up to the present day.

510. (3) **Chekhov and the Symbolists.**—Authors include Blok, Bryusov, Bely. Mr. Revutsky.

512. (3) **Problems in Eastern Europe in the Nineteenth and Twentieth Centuries. Seminar.**—Political, social and economic history of East Central Europe and the Balkans (to the end of World War II).

514. (3) **History of Russian Education.**

516. (3) **Mayakovsky's Creative Heritage.**—A study of his poems, plays, scenarios, criticism; his influence on later Soviet writers.

518. (3) **Two Centuries of the Russian Theatre (1756-1956).**

541. (3) Selected Problems of Soviet Economic Development.

549. (3) Master's Thesis.

Sociology—Ph.D. and M.A.

The Department offers studies leading to the M.A. and the Ph.D. in several fields within Sociology and Anthropology. These include (1) socialization and social control, (2) ethnography of South Asia, North America and Oceania, kinship and political organization, (3) experimental and interactional studies, (4) complex organizations and group processes and (5) comparative institutions and socio-economic change.

A. Theory and Research

501. (1-3) Seminar.

502. (1-3) Seminar.

Topics chosen from Research Techniques; Statistical Problems in Research; Construction of Theories; Classical Contributions to Theory; Current Theoretical Issues.

B. Relationships Between Individuals and Groups.

511. (1-3) Seminar.

512. (1-3) Seminar.

Topics chosen from Processes of Socialization; Small Groups; Primary Interaction.

C. Elements of Social Organization.

521. (1-3) Seminar.

522. (1-3) Seminar.

Topics chosen from Complex Organizations; Social Stratification; Structure of Communities; Demography; Industrial Sociology.

D. Institutional Areas.

531. (1-3) Seminar.

532. (1-3) Seminar.

Topics chosen from Political Sociology; Sociology of Religion; Sociology of Education; Comparative Social Institutions; Medical Sociology.

533. (1-3) Directed Studies.

540. (1) Seminar.

549. (3-6) Master's Thesis.

649. Ph.D. Thesis.

Spanish—M.A.

501. (3) Problems in Spanish Linguistics.

502. (3) Mediaeval Studies.

503. (3) The Golden Age.

504. (3) The Eighteenth-Century and Romanticism.

505. (3) Contemporary Spanish Literature.

- 506. (3) Latin American Studies.
- 520. (3) Spanish Language and Literature.
- 549. (3-6) Master's Thesis.

Theatre—M.A.

The Department offers opportunities for advanced studies in Dramatic Literature, Theatrical History and Criticism: Direction of Plays and Production; Design of Stage and Costume. The Master's programme in Playwriting is offered in cooperation with the Department of Creative Writing.

Playwriting:

- 505. (3) Advanced Scenic Design.
- 506. (3) History and Design of Theatrical Costume.
- 510. (3) Seminar in Comparative Dramatic Literature.—1966-67: The Drama of the Grotesque 1896-1966.
- 515. (3) Seminar: Studies in Theatrical Style.
- 520. (3) Advanced Direction and Production.
- 525. (3) Seminar in the Study of a Major Dramatist.
- 547. (3) Directed Studies in Theatre and Drama.
- 549. (3-6) Master's Thesis.

COMMERCE AND BUSINESS ADMINISTRATION

The degree offered is the Master of Business Administration.

Prerequisites: (i) a B.Com. degree from this University or its equivalent with standing of First Class in at least 6 units and Second Class in at least half of the remaining courses of the last two years of undergraduate work; or (ii) a Bachelor's degree with standing equivalent to that required in (i) and satisfactory standing in Commerce 323, 352, 361, 373, 381, Economics 200, 304, and if necessary an additional 3 units of background course work.

Students may make up deficiencies and proceed concurrently with the Master's course.

The Admissions Committee will assess the undergraduate background of each applicant and may recommend that additional preparatory course work be completed.

M.B.A. Course:

Fifteen units of course plus a Thesis (Commerce 549) counting 3 units. The courses will include Commerce 591 and 592, 6 units of 500-level Commerce courses, and 6 units of courses numbered 300 or above to be selected in consultation with the candidate's committee.

Prerequisite courses for non-Commerce graduates:

323. (1½) **Industrial Relations.**—A study of the problems of leadership motivation, and morale in industry. Particular attention will be directed towards the role of the personnel administrator in providing for the effective utilization of manpower resources in industry. [0-0; 3-0]

352. (3) **Managerial Accounting.**—The use of figure data in making decisions and in appraising actual operating results of business enterprises. The course will include a study of fundamental accounting postulates, as applied in financial accounting, cost accounting, and budgeting. [3-2; 3-2]

361. (1½) **Merchandising and Distribution.**—A study of the methods used in the marketing of goods and services. Problems in merchandising, selection of channels of distribution, sales promotion, advertising, and pricing. [3-0; 0-0]

373. (1½) **Business Finance.**—Types of business organization; problems of financing; provision of short-term and long-term capital; expansion and combination; public policy. Cases and assigned readings. [0-0; 3-0]

381. (1½) **Industrial Organization.**—A survey of the management functions involved in establishing and operating a business with particular reference to manufacturing. Special reading assignments and written reports. [3-0; 0-0]

Graduate Courses

507. (1½) **Seminar in Contemporary Land Investment Problems.**—Studies in investment problems, principally from the viewpoint of the individual landowner; uses of building economic analysis in cost design of buildings; influence of income tax and estate duties in investment decisions; critical study of the computation of investment returns; methods of market analysis for investment purposes.

508. (1½) Seminar in Government Policy in Relation to Urban Land Ownership.—Urban redevelopment policies; community planning; landlord and tenant legislation; mortgage policies; taxation; expropriation.

509. (1½) Seminar in Mortgage Financing.—Advanced problems arising in the mortgage money market. Emphasis on contemporary problems of flow of mortgage funds. Comparative study of government and institutional policies.

520. (1½) Organizational Behaviour and Administration.—An examination of problems and issues in the administration of human resources in business organizations. The course will concentrate on specific behavioural and attitudinal problems which face the practicing manager. Concepts, theory and research from various social sciences will be presented in analyzing determinants of and possible solutions to the problems.

521. (1½) Theory, Research and Methodology in the Study of Organizational Behavior.—An attempt to identify and integrate various theoretical frameworks utilized in the study of behaviour in business organizations. Major empirical research findings will be reviewed in the light of the theoretical viewpoints discussed. Concomitantly key methodological approaches and problems in behavioural research in business organizations will be illustrated.

522. (1½) Selected Problems in Labour Relations.—An examination of contemporary problems of labour relations, with particular emphasis on public policy issues, conciliation, and arbitration procedures, the process of labour-management accommodation to technological change, the status of unions in society and their impact on the management of industrial and commercial enterprises.

523. (1½) Seminar in Labour Relations.—An examination of major research findings in selected areas of labour relations with particular reference to the growth and potential of labour unions, their impact on management, disputes settlement, public policy issues in labour-management relations, and internal union structure.

544. (1½) Seminar in Transportation.—A study of current transportation conditions and problems. Territorial freight rate adjustments. Regulation of competition. Coordination of transportation facilities.

545. (1½) Seminar in Transportation Development Economics.—Problems in economic development including benefit-cost analysis; user-cost recovery; entry control; cooperation with neighboring states; transportation planning.

549. (3-6) Master's Thesis.—A comprehensive treatment of some theoretical or institutional problem.

551. (1½-3) Advanced Accounting Seminar.—The examination of selected areas in accounting.

552. (1½) Seminar in Income Determination.—An examination of the essential characteristics of business income, and the various unsettled issues in its calculation.

553. (1½) Seminar in Accounting Standards.—An examination of the accounting standards recommended by professional accounting bodies in Canada, the United States, and the United Kingdom—a comparison of the recommendations and a study of their impact on accounting.

554. (1½) Seminar in the Controllorship Function.—The place of the controller in the business enterprise and his responsibility for financial planning and control.

555. (1½) Seminar in Data Processing.—The processing of business data; manual, tabulating, and the electronic data-processing systems.

556. (1½) Seminar in Advanced Managerial Accounting.—Studies of Managerial tools of budgeting, costing for decision-making.

562. (1½-3) Seminar in Marketing Management.—A comprehensive analysis of certain aspects of administration and policy as related to marketing.

564. (1½) Seminar in Current Marketing Problems.—A survey of current marketing problems and their implications.

566. (1½) Seminar in International Marketing.—A study of the management of international marketing activities as performed by the individual firm. The seminar will deal with the foreign marketing of exported products and/or the products of overseas affiliates. Emphasis is placed on the policy and strategy formulation for the firm's international marketing efforts, and on the organization and administration of the firm's resources for accomplishing its international marketing objectives.

568. (1½) Seminar in International Business.—A comparative study of the business and marketing systems employed in selected nations of the world. The seminar will deal with the relationships between business and marketing practice and the socio-economic environments of these nations.

571. (1½) Seminar in Financial Institutions.—A study of the functional processes of monetary and non-monetary financial institutions participating in the market for financial assets. The seminar will deal with the implemental aspects of monetary policy and be concerned with the various attempts made to develop a theory of financial institutions.

575. (1½) Seminar in Security Analysis.—Studies of recent research in principles and techniques of security analysis; valuation of securities; analysis of investment risks; use of statistical techniques in security selection. Review of theories on security price movements.

576. (1½) Seminar in Investment Management.—Policies and practices of institutional investors. Quantitative analysis of security and real estate investments. Market behaviour.

577. (1½) Seminar in Financial Management.—Policies and practices of corporate financial management. Capital expenditures. Regulatory influences.

579. (1½) Seminar in Insurance and Risk Management.—Studies of the theory of risk, risk bearing and insurance within the framework of management decision-making. Specific topics to be dealt with will include: risk analysis; methods of meeting risk with attention given to special problems, e.g. those arising out of consolidations and foreign operations; employee group benefits; the financial aspects of social security; business life insurance; and the relationships between insurance and government.

580. (1½) Seminar in Production.—Readings and research in new techniques in manufacturing and production control.

590. (1½-3) Research in Business Administration.—Directed research in a selected area of business administration. Admission on the recommendation of the students' advisory committee.

591. (1½) Seminar in Business Policy.—A study of policy-making in business, government, and social fields.

592. (1½) Seminar in Business Administration. — An examination of present-day thinking and research in the field of business administration.

EDUCATION

The degrees offered are the Doctor of Education, the Master of Education and the Master of Arts in Education.

Ed.D. Degree

Programmes will be arranged to meet the needs of individual applicants, within the resources of the Faculty of Education and other departments of the University.

Master's degree

The following five categories of persons are admissible to Master's degree courses:

1. Those with B.A. (or its equivalent in another Faculty) with Second Class or higher standing and University postgraduate teacher training (one year) with Second Class or higher standing who have:
 - (a) Subsequent to the postgraduate Education year, 6 units of Education courses numbered 300 or above with at least Second Class standing in each course.*
 - (b) First Class standing in at least 6 units of Education courses numbered 300 or above, taken in or subsequent to the postgraduate year, or First Class standing in six units of senior academic course work appropriate to advanced study in Education.*
2. Those with B.A. (or its equivalent in another Faculty) with Second Class or higher standing and Normal School (one year) who have: First Class Standing in at least 6 units of Education courses numbered 300 or above, taken *subsequent* to Normal School.
3. Those with B.Ed. (Secondary) with Second Class or higher standing who have: First Class standing in at least 6 units of senior professional Education courses normally taken in the Fourth and Fifth Years, or First Class standing in six units of senior academic course work appropriate to advanced study in Education.*
4. Those with B.Ed. (Elementary) with Second Class or higher standing who have:
 - (a) At least 15 additional units of senior academic and/or professional work beyond the B.Ed. (Elementary) level, with an average of not less than 65%.
 - (b) First Class standing in at least 6 units of senior level professional Education Courses, or First Class standing in six units of senior academic course work appropriate to advanced study in Education.*
5. Those with a university degree with a standing sufficient for admission to a Master's degree course at this University but with no teacher training but have:
 - (a) Sufficient experience in adult or pre-school education to satisfy the Faculties of Graduate Studies and Education that teacher training requirements may be waived.
 - (b) First Class standing in at least 6 units of graduate work in Education taken *subsequent* to the university degree, or First Class standing in six units of senior academic course work appropriate to advanced study in Education.*

*Courses submitted as prerequisites must be appropriate to the academic and professional background of the candidate.

Requirements for the M.A. degree

- (a) The completion of fifteen units of graduate courses at least 3 but not more than 6 of which must be taken in an academic subject outside the Faculty of Education and related to the candidate's research project. Candidates must spend at least one full academic year in resident graduate study.
- (b) A thesis.

Requirements for the M.Ed. degree

The M.Ed. degree makes provision for a more general study, at an advanced level, of several fields. At least 3, but not more than 15 units of further study in an academic subject, are required. Arrangements for such work must be made in consultation with the Director of Graduate Studies and the head of the department concerned. This work must be in a subject for which the candidate's undergraduate programme has prepared him for advanced study. The degree need not entail research followed by a thesis; instead the amount of course work is increased to 21 units.

Every candidate for the M.Ed. degree will be required to pass a comprehensive examination covering his major field of specialization and other areas related to his Master's programme. These examinations will be available twice a year, prior to graduation in April and at the end of the summer session in August. The comprehensive examination may be both written and oral. Application for permission to take the comprehensive examination must be submitted in writing to the office of the Director of Graduate Studies by March 1 for the April examination or by July 1 for the August examination.

Residence Requirements and Transfer of Credit

The Master of Education programme may be completed by summer sessions.

Graduate courses taken at another university are not normally acceptable as credit towards these degrees unless permission prior to undertaking the courses has been given. With prior permission, a maximum of three units of credit may be obtained by transfer from another university. Correspondence and off-campus extra-session courses may be offered as prerequisites, but they are not acceptable for credit in the Master's programme.

Courses taken prior to registration and without the approval of the Faculty are not acceptable as credit towards a Master's degree. Those who wish to embark on a course for a Master's degree and have met the admission requirements should seek an interview with the Director of Graduate Studies in the Faculty of Education, or a person appointed by him, to gain approval for a planned sequence of courses, and should apply for registration. Throughout the time that a candidate is working towards the Master's degree, he will be under the guidance of a properly appointed adviser to whom he must make a regular report on his progress.

Major Fields of Specialization

All courses at the Master's level in Education are grouped for administrative convenience into four major fields: Educational Psychology, Administration and Supervision, Curriculum and Instruction, and History and Philosophy. For an M.A. degree, a student is required to take Education 581 and at least 9 units of advanced work in the major field in which the thesis will be written. For an M.Ed. degree, a student must elect at least 9 units from a major field, either professional or academic. The remaining units should include courses from separate major fields of specialization.

The organization of the Senior Education Courses under the four major fields, is as follows:

Education Psychology: 331, 332, 401, 407, 408, 411, 423, 461, 530, 533, 535, 536, 571, 575, 578, 579, 581, 582, 584, 585.

Administration and Supervision: 523, 556, 557, 558, 559, 560, 569, 576.

Curriculum and Instruction: 333, 390, 405, 406, 409, 414, 415, 416, 417, 419, 420, 490, 491, 508, 516, 517, 518, 540, 541, 542, 562, 563, 564, 565, 566, 567, 568, 572, 574.

History and Philosophy: 336, 400, 412, 430, 514, 519, 521, 523, 570, 575, 577, 583. Note: Normal School graduates may use any of these courses as prerequisites to the Master's programme, but Education 404 and 410 may not be taken for credit on the Master's programme. No course credited to a previous degree may be applied to the Master's programme.

Students holding a B.Ed. degree, with a major in Physical Education, who have been accepted for the M.Ed. degree may, with the approval of the Graduate Division of the Faculty of Education, enroll for a programme of advanced studies in Physical Education.

Students who hold full time teaching positions may not undertake more than three units (one full course) for credit during the winter.

The following courses are those applicable to the Master's and Doctoral degrees in Education. On occasion, courses at the 500-level may be taken for undergraduate credit when approved by the Director of Elementary or Secondary Education.

508. (3 or 6) Review of Research in Methods of Teaching Specific School Subjects.—Three units will be given for each course in an individual subject. No more than 6 units may be credited towards a Master's degree. Each course reviews the philosophy, purpose and function of the subject in school. Studies are made of recent research on curriculum organization, or particular methods of teaching, on the use of material aids, on factual comprehension and attitude testing. Prerequisite: Education 204 or 404.

514. (3) Foundations of Adult Education.—Historical, political and social factors which influence movements and programmes of adult education. Developments in Britain, the United States, and Canada. Philosophical problems related to the extension of adult education. Prerequisite: Education 412.

516. (3) Mass Media and Adult Education.—The major information facilities and the context for adult learning they create. Types of learning resulting from each of the major media, by means of various experiments.

517. (3) Health Education in Schools.—The philosophy, the administration and the teaching of health in schools. School medical service, the healthful school environment. Methods and materials of teaching in schools from Grade 1 through Secondary School.

518. (3) Methods of Adult Education.—Factors involved in adult learning. Learning theory, attitude change, group dynamics and special aspects of aging, and methods by which curriculum is created. Prerequisite: Education 412.

519. (3) History of Canadian Education.—The historical growth of public education in Canada from the French regime to the present. The development of provincial public school systems and Canadian educational thought and practice. Prerequisite: At least one of Ed. 400, 430, 470 or similar courses taken at another university, or History major.

521. (3) **Advanced Seminar in Philosophy of Education.**—Current trends in educational philosophy; social implications of current educational theories. Prerequisite: Education 400.

522. (3) **The Logic of Teaching.**—Analysis and study of the logical operations used in teaching. Prerequisite: Education 400, or Philosophy 202 or 212, or consent of the instructor.

523. (3) **Comparative Education.**—Comparative analysis of the social, economic, and political determinants of the organization and administration of selected foreign educational systems. Prerequisite: At least one of: Ed. 400, 430, or 470.

524. (3) **Advanced Seminar in Comparative Education.**

525. (3) **Social History of American Education.**—The interrelationship of education and social developments in the U.S.A. from the colonial period to the present. Prerequisite: One of a senior history course, Education 400, 430 or 470.

530. (3) **Psychology of Learning.**—Intraserial phenomena, maturation, effect, frequency, transfer, retention, practice, and material effects in learning. Theories of learning, and results of research in learning. Relationship of theories to methodology and curricular practices. Prerequisite: Education 102 or 301.

533. (3) **Psychology of Handicapped Children.**—Physical, mental, social, and emotional characteristics of handicapped children (backward, crippled, hard-of-hearing, etc.). Prerequisite: Education 407 or 408.

535. (3) **Evaluation.**—Basic principles; tests and other instruments for measuring instruction. Prerequisite: Education 435 or equivalent.

536. (3) **Individual Tests.**—Administration, scoring, interpreting, and values of Revised Stanford Binet, Wechsler-Bellevue, etc.; nature of intelligence; constancy of the IQ, etc.

539. (3) **Educational Television.**—An extensive study of the theory, practice, and evaluation of educational television, based on research. Prerequisite: Education 414 or consent of staff. Limited to 20 students in any one session.

540. (3) **Research in Audio-Visual Education for Schools.**—Recent research on the effects of various types of audio-visual material on learners. Review of experimental work on techniques of using audio-visual media.

541. (3) **Theory and Principles of Art Education.**—History, theories, principles, methods and practices of art education. The place and contribution of art in total education. Prerequisite: a major in Art or equivalent.

542. (3) **Theory and Principles of Music Education.**—Supervision and administration of music education. Individual projects in special interest areas. Prerequisite: a major in Music Education or equivalent.

551. (3) **Foundations for Inquiry in Educational Administration.**

552. (3) **Basic Contributions to Administrative Thought.**

553. (3) **Seminar and Group Inquiry in Educational Administration.**

556. (1½) **Administration of the Educational Programme.**

557. (3) **Administration of the Elementary School.**

558. (3) **Administration of the Secondary School.**

559. (3) **Educational Finance.**

560. (1½) School Law.

561. (3) Laboratory Practicum.—Study of individual children with educational problems. Prerequisite: Preparation in measurement, diagnosis and remedial treatment. Admission by consent of instructor.

562. (1½) Curriculum Organization in the Elementary School.—History and development of elementary curricula; principles of organization, administration, and evaluation; unit, course, and programme design.

563. (1½) Curriculum Organization in the Secondary School.—History and development of secondary curricula; principles of organization and adaptation; articulation of secondary with higher education programmes.

564. (3) Research Problems in Curriculum Organization.—Theories of curriculum organization and a review of recent research. The work of the curriculum director. Prerequisite: Education 204 or 404.

565. (3) Special Course in Subject Matter field.—Courses in various subject matter fields designed to bring teachers up to date in new advances and recent findings in each field. See also Physics 430 (Recent Developments in Physics).

566. (3) Principles of Secondary Education.—Recent thought on classroom procedures, provisions for individual differences, discipline. The place of various school subjects in total education, and remedial education in Canada and other countries.

567. (3) Principles of Elementary Education.—Recent thought on classroom procedures, provisions for individual differences, discipline. The place of various school subjects in total education, and remedial education in Canada and other countries.

568. (3) Special Education of the Orthopaedically and Neurologically Handicapped.—For specialists in the education of the crippled, hospitalized, spastic, etc. Recent research in methods of instruction. Prerequisite: Education 407.

569. (3) The Regional, Junior or Community College.—History and philosophy of the junior college. Studies of the theoretical bases for its establishment, organization, finance, personnel and curriculum.

570. (3) Advanced Seminar in Educational Sociology.—Development of social theory; contemporary systematic positions and their relation to modern educational theory. Culture. Social motivation. Social problems of administration and control. Prerequisite: Education 470 or consent of instructor.

571. (3) Advanced Seminar in Educational Psychology.—Advanced study of research and problems in learning, mental hygiene, measurement. Prerequisite: Education 530 or approved Senior Course.

572. (3) Advanced Seminar in Curriculum Organization.—Presentation and discussion of current theories and practices in curriculum organization and administration. Prerequisite: Education 562-63/or Education 564.

573. (3) Advanced Seminar on Exceptional Children.—Review of research related to diagnostic and remedial techniques in Special Education, and application of these techniques in field experience. Prerequisite: Education 533.

574. (3) Supervision of Reading.—Curriculum analysis and planning. Implications for the administrator, the consultant and supervisor of reading. Prerequisite: Consent of Instructor.

575. (3) **Educational Classics and Their Authors.**—The educational writings of such educational theorists as Plato, Aristotle, Quintilian, Castiglione, Luther, Erasmus, Ignatius of Loyola, Elyot, Bacon, Comenius, Milton, Locke, Rousseau, Pestalozzi, Herbart, Froebel, Spencer, James, Dewey.

576. (3) **Advanced Seminar in the Supervision of Instruction.**—For Superintendents, Principals, Directors of Education and other Supervisory Personnel desiring advanced study in this area. Prerequisite: Consent of Division.

577. (3) **The Educational Philosophy of John Dewey.**—Philosophic presuppositions of Dewey's educational thought; readings in Plato, Hegel, Charles S. Peirce, G. H. Mead and William James. Analysis and discussion of *Democracy and Education*, *Experience and Education* and *Art as Experience*. Prerequisite: 9 units of Philosophy or consent of the instructor.

578. (3) **Advanced Seminar in Theories of Guidance and Counselling.**—Theory, research, techniques and ethical practices in counselling. Prerequisite: Education 411. Students are also advised to take Education 332 and 535.

579. (3) **Research on Guidance Services.**—Present resources and services together with techniques of assessing and using available material. Workshop in character, requiring experimental investigations.

580. (3) **Problems in Education.**—Investigation and report of a problem.

581. (1½) **Methods of Educational Research.**—Scientific method in education; discovering problems; types of research; standards in thesis writing; critical study of published research.

582. (1½) **Statistics in Educational Research I.**—Inferential statistics including sampling theory and the testing of hypotheses as applied to educational research. Prerequisite: Education 482 or consent of instructor.

583. (3) **Advanced Seminar in Adult Education.**—Discussion of various projects in research or organization carried out by students. Prerequisite: Education 514 or 515 or 518.

584. (3) **Statistics in Educational Research II.**—Advanced statistical techniques including non-parametric statistics, factor analysis and other related topics. Prerequisite: Education 582.

585. (3) **Advanced Seminar on Research in Pre-School Education.**—Educational procedures and materials found through research to meet best the physiological, social and psychological needs of young children. Prerequisites: Education 331 and 333.

599. (3) **Master's Thesis.**

601. (3-6) **Doctoral Seminar.**

699. **Doctoral Dissertation.**

FORESTRY

Degrees offered are the Doctor of Philosophy, the Master of Forestry and the Master of Applied Science in Forest Engineering.

Ph.D. degree

Opportunities are offered for advanced study in certain fields concerned with the basic scientific or economic aspects of forestry. The Faculty of Forestry also co-operates with other departments in offering advanced work

in such fields as forest ecology, forest genetics, forest pathology, forest entomology, tree physiology, wood chemistry, and wildlife biology.

M.F. degree

Prerequisite: Bachelor's degree equivalent to the B.S.F., or B.A.Sc. in Forest Engineering, of the University of British Columbia.

M.F. Course: Thesis, counting at least 3 units, at least 3 units chosen from graduate courses in the Faculty, including Forestry 553, and other courses to complete the requirements.

M.A.Sc. degree

Prerequisite: Graduation in Forest Engineering.

M.A.Sc. course includes at least 3 units chosen from graduate courses in Forestry, at least 3 units chosen from the 300, 400, or 500 series in a department of Applied Science, and other approved courses.

In all problem and research courses, individual laboratory investigations or reviews of literature are usually planned to serve the special interests of students. When several students have a similar interest in advanced study formal lectures may be given.

549. (3-6) Thesis.—For M.F. degree.

551. (1-3) Problems in Forest Fire Control.—Mr. Smith.

553. (1) General Forestry Seminar.—Required for the first two years in residence of all graduate students in Forestry.

555. (1-3) Research in Silvics and Silviculture.—Mr. Haddock.

556. (1) Forest Tree Seed.—Seed production, collection, provenance, testing, treatment, and the application of these to the practice of forestry. Mr. Haddock and Mr. Sziklai.

557. (1-3) Problems in Forest Genetics.—Mr. Sziklai.

560. (1-3) Problems in Forest Mensuration.—Mr. Smith and Mr. Munro.

561. (1-3) Problems in Forest Management.—Mr. Griffith and Mr. Smith.

564. (1-3) Problems in Forest Photogrammetry.—Mr. Munro.

566. (1-3) Problems in Statistical Methods.—Mr. Smith.

570. (1-3) Research in Wood Anatomy and Properties.—Mr. Wellwood and Mr. Wilson.

572. (1-3) Problems in Logging Engineering.—Mr. Adamovich and Mr. Mills.

575. (1-3) Problems in Forest Products.—Mr. Wellwood.

576. (2) Commercial Timbers of the World.—Structure, identification, properties, and uses of commercial timbers of the world. Mr. Wellwood.

578. (1-3) Research in the Properties of Wood Products.—Mr. Wellwood.

581. (1-3) Problems in Forest Economics and Finance.—Mr. Smith.

599. Thesis.—For M.A.Sc. degree.

645. Thesis.—For Ph.D. degree.

The location on the campus of the Vancouver Laboratory, Forest Products Laboratories of Canada, is of special interest in the field of forest products research.

LAW

The degree offered is the Master of Laws.

Purpose

The programme provides graduates with the opportunity for advanced legal education in preparation for law teaching, legal research, public service and the practice of law.

Standard of Admission

A candidate for admission to the graduate programme must demonstrate that he is qualified to engage in creditable research in Law by possessing an adequate academic foundation and a capacity for superior performance. He must have a Bachelor of Laws degree or its equivalent from an approved law school, and must have obtained First Class standing (deemed to be 75% in legal studies in the Faculty of Law) or its equivalent in at least two of the courses and at least Second Class standing or its equivalent in the remaining courses of the final year of work that is accepted by the Faculty of Law as prerequisite to the Master's programme.

A candidate's admission is not complete until his application has been accepted and his course of study has been approved by the Faculty of Law.

Requirements of the Programme

The graduate programme in law is administered by the Faculty of Law. The requirements for the LL.M. are:

- (a) Full-time residence at the University for a minimum of one academic year (September to May).
- (b) Lectures and seminars amounting to eight class hours per week, chosen in consultation with the Faculty of Law. These may be courses presently offered by the Faculty of Law or may be arranged specially for candidates for the LL.M. A candidate must obtain an overall average of 65% on the work of the year. He may have no more than one mark falling below 65% and no mark below 60%.
- (c) A thesis of satisfactory quality prepared under the direction of a member of the Faculty of Law on a subject related to the general programme of study of the candidate. Its preparation should occupy half of the candidate's time in the programme. It should normally be completed within the period of residence, but in exceptional circumstances permission may be granted for its completion after the period of residence.
- (d) An oral examination covering the course work, the written work, or both. This requirement may be waived by the Faculty of Law.

Areas of Study

The courses offered from year to year are listed and described in the annual Calendar of the Faculty of Law, which may be obtained from the Registrar.

The programme for each candidate will be designed to meet his special needs, interests, and previous experience. Special courses may be arranged to cover various areas of the law in which the Faculty of Law has special library or other facilities. Various members of the Faculty are prepared to supervise students writing their thesis in the specific fields of law outlined in the

courses of study for the three undergraduate years, problems arising out of these courses, and such additional fields of study as may be arranged with the Faculty.

A candidate may be allowed to select courses in other faculties of the University in substitution for those mentioned in (b) above, but it is expected that the major part of his programme will be undertaken in the Faculty of Law. Some faculties which are considered as possible courses for the graduate law student are listed below, grouped under headings which indicate the relevant field of legal study.

Administrative Law:

- Political Science 302 (Public Administration)
- Political Science 502 (Public Administration)
- Sociology 325 (Theory of Organizations)

Government Regulation of Business:

- Economics 311 (Market Structure and Public Policy)
- Economics 511 (Industrial Structure and Public Policy)
- Agricultural Economics 501 (Advanced Marketing)

Constitutional Law:

- History 420 (Evolution of the Canadian Constitution)
- Political Science 401 (Canadian Government and Politics)
- Political Science 407 (American Government and Politics)
- Political Science 501 (Seminar in Canadian Government & Politics)
- Political Science 506 (Models of the Political System)

Criminal Law:

- Social Work 629 (Contemporary Issues in Corrections)

International Law:

- Economics 502 (International Trade)
- Political Science 398 (International Organization since 1919)
- Political Science 409 (Comparative Foreign Policies)
- Political Science 410 (International Violence and its Control)
- Political Science 509 (International Organization)

Jurisprudence:

- Philosophy 425 (Philosophy of Social Science)
- Philosophy 512 (Seminar on Political Philosophy)
- Philosophy 212 (Deductive Logic)
- Philosophy 320 (Empiricism)
- Philosophy 302 (Ethics)
- Philosophy 402 (Symbolic Logic)
- Philosophy 304 (Political Theory)
- Political Science 500 (Political Theory)

Labour Law:

- Commerce 322 (Labour Relations)
- Economics 407 (Labour Economics)
- Economics 507 (Labour Economics)

Municipal Law:

- Political Science 404 (Municipal Government)

Land Use Control:

- Commerce 307 (Urban Land Investment)

- Commerce 309 (Urban Land Investment)
- Commerce 407 (Land Value and Valuation)
- Commerce 507 (Land Investment Problems)
- Commerce 508 (Government Policy in Urban Land Ownership)

Natural Resources:

- Economics 309 (Economics of Natural Resources)
- Economics 509 (Economics Analysis and Natural Resources)
- Forestry 363 (Forest Management I)
- Forestry 463 (Forest Management II)
- Geography 307 (Political Geography)
- Applied Science 350

Taxation:

- Economics 310 (Government Finance)
- Economics 510 (Government Finance)
- Commerce 552 (Income Determination)

Application

Candidates seeking admission to the graduate programme should obtain application forms and other information from the Registrar of the University. Completed forms must be received by the Registrar by February 1 preceding the academic year for which admission is sought.

MEDICINE

The Doctor of Philosophy degree is offered in Anatomy, Biochemistry, Pharmacology and Physiology. The Master of Science degree is offered in these same departments. In the Department of Psychiatry the M.Sc. degree is offered in Psychiatry and also in Neurology. The M.Sc. degree in the field of Genetics is offered in combination with various departments.

Anatomy—Ph.D. and M.Sc. degrees

Ph.D. degree

Facilities are available for original investigation in descriptive anatomy, histology and endocrinology.

M.Sc. degree

Prerequisite: An M.D. degree or equivalent, or a Bachelor's degree with Honours in Zoology, or the courses accepted as prerequisite for the Master's degree in Zoology.

500. (6) **Gross Human Anatomy.**—An advanced laboratory course in the structure of the human body.

501. (3) **Microscopic Human Anatomy.**—An advanced laboratory course in the microscopic structure of the human body.

502. (4) **Microscopic Anatomy.**—The microscopic anatomy of tissues and organs in man. Prerequisite: Anatomy 401 or equivalent.

504. (1) **Seminars in Ultrastructure.**

510. (2) **Neuroanatomy.**—The gross and microscopic study of the nervous system in man.

511. (3) **Neuroanatomy.**—Selected advanced topics.

548 (1-3) **Directed Studies in Anatomy.**

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Biochemistry—Ph.D. and M.Sc. degrees

Ph.D. degree

Facilities are available for original investigations in several fields of biochemistry. Candidates must hold a Master's Degree in Biochemistry or the equivalent and are required to complete courses in Biochemistry and related fields in accordance with the recommendations of the Department and the Candidate's Committee.

M.Sc. degree

Prerequisite: An M.D. degree; or a Bachelor's degree with Honours in Biochemistry or related fields in Agriculture, or in Biology, Botany, Chemistry, Microbiology, Physiology or Zoology; or the courses accepted as prerequisites for the Master's degree in one of these subjects.

M.Sc. course includes Biochemistry 400, or 420 and 421, if not already taken; Thesis, counting 6 units, and courses approved by the department in Biochemistry in related fields.

Biochemistry 410, or the equivalent, is prerequisite to all graduate courses in Biochemistry. Students are advised not to take graduate courses in Biochemistry unless they have obtained at least 65% in Biochemistry 410 or the equivalent.

500. (1) **Biochemical Methods.**—A study of the principles of modern advanced biochemical techniques and their application to the solution of biochemical problems.

502. (1) **The Biochemical Function of Proteins.**—Modern concepts of the relationship between macromolecular structure and biochemical function. Given 1966-67 and alternate years.

503. (1) **Biochemistry of the Nucleic Acids.**—The chemical, physical and biological properties of nucleotides and nucleic acids, the elucidation of nucleic acid structures and modern concepts of their function and replication in the cell. Given 1966-67 and alternate years.

504. (1) **Biochemistry of Amino Acids and Proteins.**—Metabolism of individual amino acids and modern concepts of the biosynthetic mechanisms leading to the formation of proteins by cellular components. Given 1966-67 and alternate years.

505. (1) **Biochemistry of Carbohydrates.**—The metabolism and function of polysaccharides and the metabolic reactions associated with monosaccharides. Given in 1967-68 and alternate years.

506. (1) **Biochemistry of Lipids.**—Modern concepts of the metabolism and biochemical function of fats, phospholipids and cholesterol. Given 1967-68 and alternate years.

507. (1) **Biochemistry of Steroids and Hormones.**—Modern concepts of the metabolism and biochemical function of the sterols, bile acids, steroid hormones, catecholamines and peptide hormones. Given 1967-68 and alternate years.

530. (1) **Seminar in Biochemistry.**—Attendance is required of all graduate students in Biochemistry. Normally each will present one paper per year on a topic approved by his research advisor or committee or on the results of his research.

548. (1-3) **Directed Studies.**—In special cases, with approval of the Head of the Department, advanced courses may be arranged for graduate students in attendance.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Neurology—M.Sc. degree

Prerequisites: An M.D. degree, or a Bachelor's degree with Honours in one of the related fields in Agriculture, Biology, Botany, Biochemistry, Chemistry, Microbiology, Physics, Psychology, or Zoology; or the courses accepted as prerequisites for the Master's degree in one of these fields.

M.Sc. course includes Thesis, counting 6 units, and approved courses in related fields.

It is recommended that students intending to take this degree complete basic work in Chemistry, Physics, Psychology, and Physiology in their undergraduate work.

(See *Psychiatry*)

Pharmacology—Ph.D. and M.Sc. degrees

Ph.D. degree

Facilities are available for original investigation in certain fields of pharmacodynamics.

M.Sc. degree

Prerequisite: An M.D. degree; or a Bachelor's degree with Honours (or equivalent scholastic standing) in Biochemistry, Biology, Chemistry, Microbiology, Pharmacy, Physiology, or Zoology. Credit must have been obtained

for Chemistry 230 (or former 300) and Physics 101 or 110. Chemistry 305 and Physics 220 and 420 are also recommended.

Course: If not already taken, Physiology 400, or 410 and 411; Biochemistry 400 or 410; Pharmacology 425; thesis, counting 6 units, and courses in related fields selected in consultation with the Department.

500. (2) **Advanced Pharmacology.**—Lectures, conferences, and supervised reading in the pharmacological literature. Prerequisite: Pharmacology 425 or its equivalent.

511. (2) **Pharmacology Seminar.**

512. (4) **Advanced Pharmacological Techniques.**—Lectures, conferences, assigned readings and laboratory exercises in methods and instrumentation available for studying various types of drugs. Prerequisite: Pharmacology 425 or its equivalent.

513. (2) **Pharmacology of Anaesthesia.**—Advances in the pharmacological aspects of anaesthesiology. Conferences, assigned reading and laboratory exercises demonstrating the actions of drugs as currently applied in the practices of anaesthesiology. Prerequisite: Pharmacology 425 or its equivalent.

514. (5) **Neuropharmacology.**—Chemical mediation of central synapses and the action of drugs on the central nervous system will be emphasized. Conferences, assigned reading, and laboratory exercises. Prerequisite: Pharmacology 425 or its equivalent.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Physiology—Ph.D. and M.Sc. degrees

Ph.D. degree

The Department offers opportunities for advanced study in the field of mammalian physiology.

Studies in cognate fields will be selected in consultation with the candidate's committee.

M.Sc. degree

Prerequisite: An M.D. degree; or a Bachelor's degree with Honours in Physiology or related fields in Agriculture, or in Biology, Botany, Biochemistry, Chemistry, Microbiology or Zoology; or the courses accepted as prerequisites for the Master's degree in one of these subjects.

Course: Physiology 410, 411 and Biochemistry 400 or 410, if not already taken; Thesis, counting 6 units, and approved courses in related fields.

Physiology 410, Biochemistry 410, or the equivalent, or consent of the Department, are prerequisite to all graduate courses.

510. (3) **Neuro Physiology.**—Contact Department for more details.

511. (1-3) **Seminar in Mammalian Physiology.**—Seminar in selected topics in mammalian physiology.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Psychiatry—M.Sc. degree

For prerequisites and course consult the Department.

Required courses for the degree include Psychiatry 500, 501, 510, 520, 530, 540, and other courses designated by the Department.

500. (1) **The History of Psychiatry.**—A series of lectures and seminars given on alternate years in the second half of the year and concerned with an historical review of psychiatry from earliest times to the present.

501. (1) **Psychopathology.**—A series of lectures and seminars concerned with a presentation for graduate students of signs, symptoms and syndromes in psychiatry. Texts and readings are assigned.

502. (1) **The Interview and the Examination of the Patient.**—Lectures and demonstrations concerned with the concepts, processes and clinical skills required in interviewing both for diagnosis and for treatment. Texts and readings are assigned.

503. (2) **Psychotherapy I.**—Lectures, demonstrations and tutorials in an introduction to processes and techniques of individual psychotherapy. Texts and readings are assigned. Psychiatry 501 and 502 are prerequisites.

504. (1) **Drugs and Somatic Treatments in Psychiatry.**—Lectures and demonstrations concerned with a presentation of the rationale and use of drugs and somatic treatments. Texts and readings are assigned. Psychiatry 501 and 502 are prerequisites.

505. (1) **Methods in Evaluation and Research.**—A course of seminars and demonstrations dealing with methods and techniques for the evaluation of programmes and treatment in Psychiatry, with research design and research procedures, including such problems as the use of controls in psychiatric research, the use and interpretation of statistics, etc. Texts and readings to be assigned. The course is given in alternate years.

506. (1) **The Province and Functions of Psychiatry.**—A course of lectures and seminars dealing with roles, responsibilities and functions assumed by and assigned to psychiatry in medicine and in the community. The course deals with the patterns by which care has been made available in the past, with contemporary patterns now emerging, with the assumptions underlying these developments, and with the problems and issues that appear to be of relevance to psychiatry in the future. Given in alternate years.

507. (2) **Psychotherapy II.**—An advanced course concerned with the processes, techniques and theories of individual psychotherapy. Prerequisite: Psychotherapy I. Texts and readings are assigned. The course includes three hours of individual tutorial per week.

508. (1) **Group Therapy and Milieu Therapy.**—This course of lectures and demonstrations given in the third year deals with the theoretical and practical issues met with in the use of various social groupings—the therapeutic small group, the family, the ward and the community—in psychiatric treatment. Psychiatry 503 and 507 are prerequisites.

509. (1) **Theories and Etiology.**—This course deals with the “dynamics” of human behaviour and the etiology of mental illness in a comprehensive manner at three levels of organization—molecular and cellular, psychological and social.

510. (2) **The Neurological Basis of Human Behaviour.**—Concerned with the structure, development and function of the human nervous system and the relationship of these to normal and abnormal human behaviour, thinking and emotions. Given through the second year. Psychiatry 501 and 504 are prerequisites. Texts and readings are assigned.

511. (1) **The Neurological Basis of Human Behaviour (Laboratory).**—Dissections and demonstrations of the structure and functions of the human nervous system. Prerequisite: Psychiatry 510.

512. (1) **Problems of Cerebral Function.**—A dissertation in a field related to the content of Psychiatry 510. Prerequisite: Psychiatry 510.

513. (1) **Behaviour Physiology.**—An advanced course of lectures and seminars provided on an elective basis in the second half of the year and concerned with a survey of experimental work on the process of the nervous system underlying normal and abnormal behaviour in humans and primates; with special emphasis on the physiological correlates of higher nervous activity. Prerequisite: Psychiatry 501. Texts and readings to be assigned.

514. (1) **Neurochemistry.**—An advanced course provided on an elective basis laboratory chemical principles underlying mental functions. Current findings and theories on chemical aspects of mental illness and certain neurological disorders are presented and discussed. Prerequisite: Psychiatry 501.

515. (1) **Psychopharmacology.**—An advanced elective course presenting current facts and theories relating the use of various drugs, experimental and therapeutic, to basic chemical and enzymatic processes in brain and nervous tissue, with special reference to mental illness and research in psychiatry. Prerequisite: Psychiatry 501. Texts and readings to be assigned.

520. (2) **Social Psychiatry.**—A course of lectures and seminars dealing with the relationships between mental illness and a range of social and ecological variables, and with current epidemiological knowledge about the frequency and distribution of mental illness. Texts and readings are assigned.

530. (2) **Development and Learning.**—This course deals with individual development as related to personality growth, mental health, and mental illness. This is a required course for the second year. Text and readings are assigned.

531. (1) **Child Psychiatry.**—This course deals with diagnosis, prevention and treatment of mental illness and mental retardation in children. Psychiatry 530 is a prerequisite.

540. (1) **Psychological Measurement.**—This deals with the rationale and administration of various psychological tests and measurements in the clinical setting, and with personality and other theories underlying their use. The course has been developed for both psychiatrists and clinical psychologists in training. Given in the first year. Readings and texts are assigned.

550. (3) **Directed Studies.**—This provides for a programme of directed reading and study in such special area or areas as may be relevant to the student engaged in some particular area of study and research in Psychiatry.

560. (6) **Master's Thesis.**

PHARMACY

The degree offered is the Master of Science in Pharmacy.

Prerequisite: A Bachelor of Science in Pharmacy degree or its equivalent with a background of acceptable science courses. The specific prerequisite courses in the case of each applicant will be determined in relation to the field of the proposed thesis.

M.S.P. course: Thesis counting from 5 to 6 units, and courses numbered 300 or above so that the total number of units, including the Thesis, is at least 18 units. The programme will normally include at least 6 units of courses numbered 500 or above. At least 3 and not more than 6 units must be taken in related fields outside the field of major interest.

501. (3) **Physical and Chemical Aspects of Pharmaceutical Systems.**—A study of problems in formulation, production, stabilization, and preservation of pharmaceuticals. Laboratory demonstrations and special assignments may be included in the course.

520. (2) **Advanced Medicinal Chemistry.**—Conferences and supervised reading in the literature of medicinal chemistry. A consideration of recent theoretical advances in medicinal chemistry.

530. (2) **Advanced Pharmacognosy.**—A detailed study of selected compounds of biological origin useful in the fields of Pharmacy and Medicine.

540. (2) **Topics in Pharmacology.**—Lectures and supervised studies in selected areas of pharmacology.

548. (1) **Seminar.**—Attendance at regular seminars throughout the session and presentation of one or more papers on selected topics.

549. (6) **Master's Thesis.**

550. (1-3) **Directed Studies.**

PHYSICAL EDUCATION

The degree offered is the Master of Physical Education.

Prerequisite: Bachelor's degree equivalent to the B.P.E. of the University. Physical Education 470 (Tests and Measurements) or an equivalent course.

M.P.E. Course: a total of 18 units, including a thesis (counting from 3 to 6 units), required advanced courses in Education and Physical Education, and courses in other departments.

500. (1-3) Graduate Seminar.

530. (1-3) Directed Studies

563. (1½) Physical Fitness Seminar.—Elements of fitness; physical fitness testing; bodily changes prior to, during and following exercise.

565. (1½) Analysis of Physical Activity.—A review of techniques used in evaluating physical performance with special reference to the interdisciplinary nature of such work.

570. (1½) Review of Research in Physical Education.—Historical, philosophical; anthropometric and body mechanics; related physiological and psychological research.

571. (1½) Physical Rehabilitation Laboratory.—The theory and practice of physical rehabilitation and its relation to physical education; practical experience in handling rehabilitation cases; work will be assigned at River-view Hospital, Essondale; G. F. Strong Rehabilitation Centre; Workmen's Compensation Board, or at the Vancouver General Hospital.

580. (1½) Current Problems in Physical Education.—Objectives; programmes; leadership; history and trends; professional status; community organizations and auspices.

583. (1½) Physical Education Programmes.—The development of curricula in physical education; relationships of programmes in schools, community centres and other institutions.

584. (1½) Motor Skills and Physical Efficiency of Young Children.—Survey of the literature in child development with special emphasis on physical growth and skill acquisition. Development of limited research projects by individual students and presentation of a seminar report on one research aspect of child development.

599. (3-6) Thesis.

SCIENCE

Doctoral and Master's degree programmes are offered in each of the departments and fields of study listed below.

Chemistry—Ph.D. and M.Sc. degree

Ph.D. degree

The Department offers facilities for research studies in the following fields:

Chemical Kinetics.—Electron and energy transfer processes, oxidation reactions, photochemistry, thermal reactions, free radical reactions, homogenous and heterogeneous catalysis, isotopic exchange reactions.

Spectroscopy and Molecular Structure.—Electronic structure of molecules, nuclear magnetic resonance, molecular complexes, the paramagnetic resonance spectroscopy of free radicals, spectroscopic properties of free radicals at liquid helium temperature, X-ray crystallography, infra-red spectroscopy, Raman spectroscopy.

Mass Spectrometry.—The ionization and dissociation of molecules and free radicals by electron impact, isotope studies. Photoionization studies. Ion-molecule reactions. Determination of molecular structure by high-resolution mass spectrometry.

Electrochemistry.—Conduction in non-aqueous solvents, polarography.

Physical-Inorganic Chemistry.—Structure of metal complexes, lamellar compounds. Structure of inorganic and organometallic compounds by infra-red, Raman, and nuclear magnetic resonance spectroscopy. Chemical aspects of the Mössbauer Effect.

Chemical Oceanography.—Trace metals and constitution of sea water.

Natural Products.—Wood chemistry, carbohydrates, stereo-chemistry; chemistry of steroids, alkaloids, and terpenes, chemistry of biologically important substances, heterocyclic chemistry. Biogenesis of alkaloids, steroids, and other natural products.

Physical Organic Chemistry.—Reaction mechanisms, solution equilibria, stereochemistry, photochemical syntheses.

Inorganic Chemistry.—Fluorine chemistry, decomposition of inorganic compounds by X-ray and high energy radiation, organometallic, metalloidal and coordination chemistry, the chemistry of non-aqueous solvents. Phosphonitriles and related compounds.

Polymer Chemistry.—Synthetic high polymers, physical properties of polymers, nuclear magnetic resonance studies of the structure of high polymers.

Theoretical Chemistry.—Quantum chemistry, non-equilibrium statistical mechanics.

Surface and Solid State Chemistry.—Chemical reactivity of ionic crystals; physics and chemistry of adsorption.

M.Sc. degree

Prerequisite: Honours in Chemistry or Physics, or combined Honours in Chemistry and Physics, Chemistry and Mathematics, or Chemistry and Biology; or a Bachelor's degree in Chemical Engineering with at least Second Class standing; or a single Major in Chemistry with at least Second Class standing; or Chemistry 200, 230, 304, 310, 407 (or 409), Physics 200, Mathematics 300 or 323.

Course includes Thesis, Chemistry 504, and Chemistry 548.

500. (3) **Introduction to Research Methods.**—This course must be taken by all beginning graduate students in Chemistry who, in the opinion of the Department, may not have had a sufficient introduction to the modern techniques currently used in research in the Department of Chemistry.

501. (2) **Topics in Physical Chemistry.**—A discussion of some aspects of modern physical chemistry. The subject matter varies each year and is chosen to be suitable for *all* graduate students in Chemistry.

503. (1) **Seminar in Special Topic.**—A seminar course dealing with recent developments in the student's special field of Chemical Science.

504. (1) **Seminar in Chemistry.**—This course is compulsory for *all* graduate students in Chemistry.

505. (1) **Quantum Chemistry.**—Application of quantum mechanics to chemistry. Group theory and molecular symmetry.

506. (1) **Advanced Theoretical Chemistry.**—An advanced course in which will be discussed more recent applications of quantum mechanics and statistical mechanics in chemistry.

507. (1) **Transport Properties of Gases.**—Fundamental aspects of the transport properties of gases; Boltzmann Equation, Chapman-Enskog method of solution, transport coefficients, recent developments.

508. (1) **Topics in Chemical Physics.**—Intermolecular forces, relaxation processes in chemistry, electron impact phenomena, electron spin resonance spectroscopy, nuclear magnetic resonance phenomena, energy exchange in molecular systems, theories of molecular interactions.

512. (1) **Colloid Chemistry.**—Properties of disperse systems, thermodynamics, molecular weight and shape, electrophoresis, viscosity, polyelectrolytes.

513. (1) **Chemical Thermodynamics.**—A study of the principles and applications of classical chemical thermodynamics.

515. (1) **Advanced Electrochemistry.**—Modern measurements of conductance, transport and electromotive force; thermodynamics of solutions; Debye-Huckel interionic attraction theory; electrode processes and polarography.

517. (2) **Topics in Inorganic Chemistry.**—Selected topics of current interest in inorganic research and in applications of inorganic chemistry. The subject matter changes each year, and is suitable for all chemistry graduates.

518. (1) **Advanced Inorganic Chemistry.**—Selected topics of inorganic stereochemistry, considered in relation to bond type and position in the Periodic Table. The chemistry of some of the less familiar elements.

519. (1) **Radiochemistry and Radiation Chemistry.**—An advanced course. Natural and artificial radioactive nuclides, nuclear reactions, trans-uranic elements, tracer techniques and applications.

520. (2) **Spectroscopy and Molecular Structure.**—Physical methods for elucidating molecular structure.

521. (1) **Statistical Mechanics.**—Fundamental principles of classical and quantum statistical mechanics. Selected applications, with particular reference to gases, crystalline solids, and chemical reactions.

522. (1) **Surface Chemistry.**—Theories of the adsorption of gases and the kinetics of heterogeneous reactions. Recent advances in heterogeneous catalysis and the structure of solid surfaces.

523. (1) **Chemical Kinetics.**—Types of reactions, kinetic theory, energy transfer processes, transition state theory, chain reactions, reactions in solution, heterogeneous processes, photochemistry.

524. (1) **Chemistry of the Solid State.**—Aspects of the structure of solids and the nature of defects in solids in relation to the mechanism of chemical reactions involving solids.

525. (1) **Crystal Structures.**—Crystal structures and structural analysis by the methods of X-ray diffraction, neutron diffraction, and nuclear magnetic resonance.

526. (1) **Physical Chemistry of High Polymers.**—Nature and kinetics of vinyl and condensation polymerization; molecular weight determination; distribution of molecular weights; introduction to kinetic theory of rubber elasticity; physical properties of polymers in the solid state and in solution.

528. (1) **Inorganic Reaction Mechanisms.**—Substitution reactions of inorganic complexes, electron transfer reactions, free radical reactions, photochemical reactions of metal complexes. Catalytic reactions of metal carbonyls, hydrides, and organometallic complexes. Proton transfer reactions.

529. (1) **The Chemistry of Organometallic Compounds.**—The preparations, properties, and structures of aliphatic and aromatic derivatives of metals and metalloids, and of olefinic, acetylenic, and arene derivatives of the transition metals.

530. (2) **Topics in Organic Chemistry.**—Selected topics of current interest in organic chemistry. The subject matter changes each year and is suitable for all chemistry graduates.

531. (1) **Organic Stereochemistry.**—The determination of absolute configuration of synthetic organic compounds and natural products. Stereo-selective syntheses. Conformational analysis and organic reaction mechanisms.

532. (1) **Heterocyclic Compounds.**—Advances in the chemistry of pyrrole, furan, thiophene and their derivatives. Heterocyclic compounds of biological importance.

533. (1) **Carbohydrates.**—Introduction to recent work in the field of carbohydrate chemistry.

535. (1) **Alkaloid Chemistry.**—Recent progress in structural and biosynthetic aspects of the chemistry of the alkaloids.

536. (1) **Isoprenoid Compounds.**—Chemistry and biosynthesis of terpenes, steroids and carotenoids.

537. (1) **Cellulose, Lignin and Related Compounds.**—Analytical, physical and organic chemistry of these plant constituents.

538. (1) **Physical Organic Chemistry.**—Electronic and steric effects, acidity functions, isotope effects, linear free energy relations.

540. (1) **Modern Organic Analysis.**

541. (1) **Organic Reaction Mechanisms.**—Ionic and free radical reaction mechanisms. The formation and stereochemistry of reaction intermediates.

542. (1) **Structure of Newer Natural Products.**—A discussion of recent developments in the chemistry of alkaloids, antibiotics, hormones and other recently discovered natural products.

543. (1) **Recent Synthetic Methods in Organic Chemistry.**—Synthetic methods with particular reference to the use of modern reagents and techniques.

544. (1) **Chemistry of Polysaccharides.**—Structure and properties of the major groups of polysaccharides other than cellulose.

548. **Research Conference.**—Attendance is required in each year of registration for the M.Sc. or Ph.D. in chemistry. No unit value.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Genetics—Ph.D. and M.Sc. degrees

1. Genetics is not treated as a department, but as a field of study. Instruction is offered by the Departments of Biology and Botany, Microbiology, Zoology in cooperation with the Departments of Animal Science, Plant Science, and Poultry Science in the Faculty of Agriculture, the Department of Paediatrics in the Faculty of Medicine, and the Faculty of Forestry.
2. The following courses will be accepted for credit:
 - (a) Appropriate graduate courses in the departments and faculties mentioned.
 - (b) Certain courses numbered 400 and above in genetics and related subjects as approved in particular cases.

Geology—Ph.D. and M.Sc. degrees

Ph.D. degree

Courses in Geology and related fields will be selected in consultation with the candidate's committee.

Generally, the candidate will select one of two broad programmes:

- (a) Economic geology, mineralogy, petrology and structural geology.
- (b) Palaeontology, stratigraphy, and sedimentation.

All candidates, however, must attain reasonable competence in all of these fields.

The thesis will generally require as a basis field work that may take several months to complete.

M.Sc. degree

Prerequisite: Honours or major in Geology.

Course includes Thesis, Geology 504, and Geology 545.

504. (1) **Advanced Structural Geology.**—A course dealing with major problems of earth structure. Mr. Ross.

505. (3) **Structural Analysis.**—Structural analysis of folded rocks, laboratory and seminar. Mr. Ross.

511. (3) **Geology of North America.**—Evolution of the continent of North America and stratigraphy, structure, and geomorphology of Alaska, Canada, United States, Greenland, Mexico, Caribbean Area, Hawaiian Islands and the eastern Pacific Ocean. Emphasis on the study of geologic features of special interest in these areas including fossil localities. Mr. Danner. (Given in 1966-67 and alternate years.)

514. (3) **Problems of Stratigraphy.**—Seminar and laboratory. Problems of clastic, nonclastic and volcanic-sedimentary deposition. Stratigraphic paleontology. Emphasis on the stratigraphic associations of the eugeosynclinal or volcanic belts. Given in alternate years starting 1967-68. Mr. Danner and Mr. Murray.

519. (1½) **Seminar in Sedimentology.**—Principles of sedimentation as applied to modern and ancient deposits. Mr. Murray.

520. (1½) **Problems in Sedimentology.**—Directed laboratory study in problems in sedimentology. Prerequisite: Geology 401. Mr. Murray.

521. (3) **Problems in Paleontology.**—Seminar; principles of paleontology, taxonomy and evolution applied to selected pre-Cenozoic metazoan invertebrate groups; alternates with 531. Prerequisite: Geology 306. Mr. Best. Given in 1966-67.

523. (3) **Advanced Mineralogy.**—Seminar; some of the rarer minerals, particularly those of economic importance. Text: Palache, Berman, Frondel, *Dana's System of Mineralogy*, Vols. 1-3; Deer, Howie, Zussman, *Rock Forming Minerals*, Vols. 1-5, Longmans. Mr. Thompson.

524. (3) **Advanced Geochemistry (Mineral Research).**—Study of approved problems, using advanced techniques. Prerequisite: Geology 324 or equivalent. Mr. Delavault.

525. (3) **Igneous and Metamorphic Petrology.**—Seminar. Prerequisite: Geology 407. Mr. McTaggart.

526. (3) **Mineral Deposits.**—Seminar; character, origin, and structure of mineral deposits, with emphasis on ore deposits. Mr. White.

531. (3) **Advanced Invertebrate Paleontology.**—Alternates with Geology 521. Selected groups of fossils, special problems of paleontology, paleontological techniques. Prerequisite: Geology 306. Mr. Okulitch.

541. (3) **Paleobotany.**—Origin and history of plants through the geologic time. The floras of Paleozoic, Mesozoic and Cenozoic era. Techniques of collecting, preparation and identification of fossil plants and pollen. The use of fossil plants as indicators of geological age and ecology. Prerequisite: Geology 306. (Given in 1967-68 and alternate years.) Mr. Rouse.

545. (1½) **Reading Course.**—Assigned reading dealing with problems of geology. Required of all graduate students.

549. Master's Thesis.

649. Ph.D. Thesis.

Geophysics—Ph.D., M.Sc. and M.A.Sc. degrees

Ph.D. degree

The Department offers facilities for research in a number of fields including the following.

(a) *Isotopic Studies and Mass Spectrometry*

Most work to date has been on common lead isotopes. The scope of the laboratory is being expanded to include studies of argon and strontium. Improved facilities and techniques in the use of mass spectrometry applied to various geophysical studies are being actively investigated.

(b) *Geomagnetism and Upper Atmospheric Physics*

The main emphasis has been on micropulsations of the Earth's electromagnetic field. This has been extended to fundamental problems of the magnetosphere and other solar terrestrial relationships. A permanent observing station has been established at Westham Island 25 miles from Vancouver and combined studies are carried out in cooperation with the Pacific Naval Laboratory, Esquimalt.

(c) *Seismology*

Analysis of earthquake records, using time-series techniques and digital filtering, is currently the principal interest. Studies of seismic instrumentation, and of the generation and propagation of elastic energy in two-dimensional models also form part of the research programme.

(d) *Gravity*

The figure of the Earth.

M.Sc. degree

Prerequisites: Honours in any of the Physical Sciences, including satisfactory standing in Physics 200, 300, 315, 400 or equivalent courses, and at least one mathematics course numbered 300 or above.

M.Sc. course includes Thesis, counting 6 units, and Physics 502 and Geophysics 501. Physics 405, 458 and 502 are considered courses in the field of Geophysics. Students with no formal training in Geology may be required to take courses in that field.

M.A.Sc. degree

Prerequisites: Graduation in Engineering Physics, Electrical Engineering or Geological Engineering (Option II).

M.A.Sc. course includes Thesis, counting 6 units, and Physics 502 and Geophysics 501. Physics 405, 458 and 502 are considered courses in the field of Geophysics.

501. (2) **Advanced Geophysics.**—A detailed discussion of the constitution of the Earth as deduced from seismic, magnetic, gravimetric and thermal studies.

502. (2) **Principles of Earth Science.**—A detailed discussion of geologic evidence bearing on graduate research in the geophysics department. Prerequisite: consent of the instructor.

511. (1-2) **Seismology.**—Theory of seismic waves and seismographs; focal mechanism, magnitude and statistics of earthquakes; interpretation of surface wave dispersion curves.

512. (1-2) **Geomagnetism and Aeronomy.**—Transient variations, magnetic storms and ionospheric disturbances.

513. (1-2) **Radioactive and Isotopic Processes in Geophysics.**—Modern methods of geochronology and the application of mass spectrometry to geological studies.

514. (1-2) **Geophysical Analysis.**—A discussion of the analysis and interpretation of geophysical phenomena; analytical treatment, numerical procedures, and application of statistical methods.

515. (1-2) **Cosmology.**—Stellar models, radiometric dating of extraterrestrial events, cosmochemistry and related topics.

520. (1-3) **Directed Studies in Geophysics.**

521. (1) **Modern Aspects of Geophysics.**—A seminar course.

549. (6) **M.Sc. Thesis.**

599. (6) **M.A.Sc. Thesis.**

649. **Ph.D. Thesis.**

Life Sciences

Biochemistry—Ph.D. and M.Sc. degrees

Ph.D. degree

Facilities are available for study in the following fields of biochemistry; metabolism and function of steroids and steroid hormones, chemistry and metabolism of nucleic acids, bacterial metabolism, action of antibiotics, electron transport and oxidative phosphorylation, protein structure and function, control of protein biosynthesis, mechanism of action of anti-cancer agents.

M.Sc. degree

Prerequisites: A Bachelor's degree with Honours in Biochemistry or related

fields in Agriculture, or in Biology, Botany, Chemistry, Microbiology, Physiology or Zoology or the courses accepted as prerequisites for the Master's degree in one of these subjects, or an M.D. degree.

M.Sc. courses include Biochemistry 400 and 430, if not already taken; Thesis, counting 6 units and courses approved by the Department in Biochemistry and related fields.

For courses see page O63.

Biology—Ph.D. and M.Sc. degrees

Biology is not treated as a department but as a field of study. Instruction is offered cooperatively by the Departments of Biochemistry, Botany, Microbiology, Physiology and Zoology. Students wishing to pursue a graduate programme in Biology should consult with the Department or Departments most appropriate to the field of specialization. In special cases interdepartmental graduate programmes can be arranged.

Botany—Ph.D. and M.Sc. degrees

Students wishing to enrol in any of the following courses should consult the instructor in charge for permission prior to registration.

500. (1) **Field Botany.**—A course designed for students proceeding to a graduate degree in Botany. Attendance may be required at the discretion of the department as a prerequisite to the degree. The course will last approximately one week and will be held immediately after the sessional examinations in April. A fee of \$25, payable to the departmental secretary on registration in September, is levied to help defray expenses. Field studies will focus attention on the ecology, taxonomy and life histories of representative plant groups. Written reports will be required as directed.

504. (3) **Taxonomy of Vascular Plants.**—Before registration in this course students are required to collect at least 150 species of vascular plants. Part of the laboratory mark for the course is assigned to this collection. Mr. T. M. C. Taylor.

505. (2) **Cytogenetics of Natural Populations.**—Application of cytogenetic principles to the study of evolution and present-day relationships of vascular plants. Miss Beamish.

510. (2) **Marine Phycology.**—Collection, identification, ecology and life histories of algae; emphasis on marine benthonic forms. (Given in 1967-68 and alternate years.) Mr. Scagel.

511. (3) **Freshwater Phycology.**—Collection, culture techniques, identification, ecology and life histories of the freshwater forms. (Given in 1966-67 and alternate years.) Miss Stein.

512. (2) **Marine Phytoplankton.**—Collection, identification and quantitative analysis of marine phytoplankton in relation to oceanographic factors. Prerequisite: Oceanography 506. (Given in 1967-68 and alternate years.) Mr. F. J. R. Taylor.

513. (2) **Cytology of Marine Algae.**—A cytomorphological study of marine algae, including a detailed discussion of nuclei and chromosomes. Miss Cole.

515. (3) **Advanced Mycology.**—Taxonomy of fungi; identification, nomenclature, classification. A collection of at least 40 mycological specimens must be made prior to the course. (Given in 1966-67 and alternate years.) Mr. Bandoni.

517. (3) **Marine Mycology.**—Structure, classification, culture, and physiology of marine and brackish water fungi. Special problems on groups or individual species. (Given in 1967-68 and alternate years.) Mr. Hughes.

518. (3) **Advanced Forest Pathology.**—Lectures, laboratory periods and student seminars to cover hereditary, physiological, anatomical, and micro-biological factors of trees that influence levels of resistance or susceptibility to disease. Emphasis on critical analyses of host-pathogen relationships of representative micro-organisms causing different types of tree disease, including the effects from genetic variation within pathogens. (Given in 1966-67 and alternate years.) Mr. Bier.

520. (3) **Phytogeography.**—Historical and floristic plant geography. The pattern, dynamics and ecology of plant distribution. Terrestrial plants stressed. (Given in 1966-67 and alternate years.) Mr. Schofield.

525. (3) **Advanced Plant Autecology.**—(Given 1967-68 and alternate years.) Mr. Krajina.

526. (3) **Advanced Plant Synecology.**—(Given in 1967-68 and alternate years.) Mr. Krajina.

530. (3) **Advanced Plant Physiology I.**—Studies of the processes and significance of photosynthesis, respiration, and the metabolism of carbohydrates, nitrogen and lipid compounds in plants. (Given in 1967-68 and alternate years.) Mr. Tregunna.

531. (3) **Advanced Plant Physiology II.**—Studies of water relations, mineral nutrition, translocation, growth and development in plants. (Given in 1966-67 and alternate years.) Mr. Wort.

540. **Advanced Palaeobotany and Palynology.**—Detailed studies of plant macro- and micro-fossils with emphasis on phylogenetical and palaeocological interpretations. (Given in 1967-68 and alternate years.) Mr. Rouse.

541. (3) **Structure and Development of Pteridophytes and Gymnosperms.**—(Given in 1966-67 and alternate years.) Mr. Kuijt.

542. (3) **Structure and Development of Angiosperms.**—(Given in 1967-68 and alternate years.) Mr. Kuijt.

543. (3) **Advanced Cytology.**—Recent advances in the field of cytology will be reviewed. Emphasis will be given to the detailed structure of cytoplasmic organelles and the nucleus in relation to function. (Given in 1967-68 and alternate years.) Mr. Bisalputra.

546. (1-3) **Advanced Topics in Botany.**—Staff.

547. (1) **Seminar on Current Topics.**—Attendance of all students proceeding to graduate degree in Biology and Botany is required during each year of residence. Papers will be presented by students, staff and visitors.

549. (3-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Microbiology—Ph.D. and M.Sc. degrees

Ph.D. degree

The Department offers opportunities for work in pathogenic bacteriology, pathogenic mycology, immunology, virology and bacterial metabolism.

M.Sc. degree

Course includes Thesis, counting at least 6 units, and approved science courses.

502. (3) **Advanced Immunochemistry.**—Lectures and laboratories on biophysical aspects of protein chemistry and on advanced immunochemical methods. Prerequisite: Microbiology 402 and Chemistry 305.

503. (3) **Bacterial Cytology and Genetics.**—Morphology and functional

significance of bacterial cell components. The role of nuclear material in determining inheritable characteristics of bacteria, viruses and fungi. Spontaneous and induced mutations. Transfer of genetic information by processes of transformation, transduction and recombination.

505. (3) **Topics in Intermediary Metabolism.**—A course of lectures dealing with aspects of intermediary metabolism selected from the current biochemical literature. Prerequisite: Microbiology 405. Given in 1967-68 and alternate years.

506. (3) **Laboratory Methods and Procedures.**—The application of quantitative and qualitative biochemical procedures to metabolic studies of microorganisms. Credit will not be given for both Microbiology 506 and 507. Prerequisite: Biochemistry 410.

507. (3) **Advanced Laboratory Methods.**—Restricted to graduate students who have had considerable laboratory experience as well as advanced courses in Microbiology and Biochemistry. Credit will not be given for both Microbiology 506 and 507.

530. (3) **Seminar in Microbiology.**

548. (3) **Directed Studies on an approved problem.**

549. (6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Physiology—Ph.D. and M.Sc. degrees

Ph.D. degree

The Department offers opportunities for advanced study in the field of mammalian physiology.

Studies in cognate fields will be selected in consultation with the candidate's committee.

M.Sc. degree

Prerequisite: An M.D. degree; or a Bachelor's degree with Honours in Physiology or related fields in Agriculture, or in Biology, Botany, Biochemistry, Chemistry, Microbiology or Zoology; or the courses accepted as prerequisites for the Master's degree in one of these subjects.

Course: Physiology 410, 411 and Biochemistry 400 or 410, if not already taken; Thesis, counting 6 units, and approved courses in related fields.

Physiology 410, Biochemistry 410, or the equivalent, or consent of the Department, are prerequisite to all graduate courses.

510. (3) **Neurophysiology.**—(Contact Department for more details.)

511. (1-3) **Seminar in Mammalian Physiology.**—Seminar in selected topics in mammalian physiology.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Zoology—Ph.D. and M.Sc. degrees

Ph.D. degree

The Department offers opportunities for advanced study in the major fields of Zoology.

Studies in cognate fields will be selected in consultation with the candidate's committee.

A candidate who has not previously spent a study period at a marine biological station will be required to do so before the completion of his course.

M.Sc. degree

Prerequisite: Honours; Biology 101 or the equivalent, Chemistry 101, 102, or 110, Physics 101 or 110, and 15 additional units in Zoology with adequate standing.

500. **Special Advanced Courses.**—Special advanced courses correlated with the work for the thesis may be arranged for a graduate student upon the approval of the Head of the Department. The credit will not be more than 3 units in any one such course.

502. (3) **Advanced Ecology.**—Practical problems in analysis of animal population statistics and construction of population models, including digital computer techniques. Seminar discussions and directed readings. Mr. Bendell, Mr. Chitty, Mr. Effort, Mr. McFadden and Mr. Wilimovsky.

503. (3) **Comparative Physiology.**—Selected topics in animal physiology. Permission of the instructors. Mr. Dehnel, Mr. Phillips, Mr. Randall.

504. (2) **Seminar in Comparative Ethology.**—Current problems in animal behaviour. Prerequisites: Zoology 422 or the consent of the Instructor. Mr. Liley.

505. (3) **Cell Biology.**—Problems and recent advances in the study of mechanisms underlying the structure, function and differentiation of cells. Consent of Instructor required for registration. Mr. Acton, Mr. Finnegan, Mr. Ford and Mr. Suzuki.

506. (1) **Marine Field Course.**—A course designed for candidates for the Ph.D. degree. Attendance is required of all such students for a two week period during their residence at the University. The course will commence immediately following sessional examinations in April. Special attention will be given the marine forms, invertebrates and fishes. Emphasis will be placed upon anatomy, taxonomy, life histories and ecology of benthic and planktonic organisms. (1965-66 and alternate years.)

507. (2) **Zoogeography.**—Factors of distribution. Faunal histories. Faunistic and descriptive zoogeography, distribution of biotic communities. (1966-67 and alternate years.) Mr. Udvardy.

508. (2) **Endocrinology.**—Lectures and directed studies of the endocrinology of vertebrates. Mr. Perks.

509. (1½) **Population Genetics.**—An introduction to the genetics of animal populations. Mr. Acton.

510. (1½) **Developmental Genetics.**—Recent advances in the study of mechanisms of the genetic control of development. Mr. Acton, Mr. Finnegan, Mr. Suzuki.

511. (2) **Marine Zooplankton.**—Oceanographic factors in relation to the distributions of marine zooplankton. Prerequisites: Zoology 301 or equivalent, and Oceanography 400. (1966-67 and alternate years.) Mr. Bary.

512. (2) **Marine Invertebrate Zoology.**—Life histories, ecology and systematics of marine invertebrates. (1967-68 and alternate years.) Mr. Dehnel.

513. (3) **Biology of Crustacea.**—Morphology, life histories and general biology of representative crustaceans. Mr. Lewis.

515. (3) **Comparative Invertebrate Embryology.**—A study of morphogenesis and developmental physiology of representatives of the invertebrates with laboratory concentration on the local marine forms. Prerequisite: Zoology 301 or equivalent. (1966-67 and alternate years.) Mr. Finnegan.

516. (3) **Advanced Entomology.**—Lectures and directed studies of advanced entomological problems. Mr. Scudder.

517. (3) **Principles and Problems of Applied Entomology.**—The biological background of research and control of injurious insects; the problems and

principles of quantitative evaluation, experimentation and manipulation of insects and their populations in relation to variability, structure, physiology, life cycles and behaviour. Mr. Graham.

519. (3) **Parasitology**.—Seminar discussions of selected topics. Basic problems of parasitism, trends in current research. Laboratory procedures in parasitology; individual projects. Prerequisite: Zoology 413. Mr. Adams.

520. (3) **Limnology**.—Physical, chemical and biological factors of lakes and streams in relation to productivity. Prerequisites: Zoology 301, 415. (1966-67 and alternate years.) Mr. Northcote.

521. (3) **Fisheries Biology and Management**.—Description of world fisheries and discussion of population problems pertinent to commercial and game fishes with review of techniques of management of fish stocks. Prerequisites: Zoology 415. Mr. Wilimovsky.

522. (2) **Limnology Seminar**.—Recent advances in limnology. Prerequisite: Zoology 520, or by permission. (1967-68 and alternate years.) Mr. Northcote.

523. (1) **Fisheries Technology**.—Handling, preparation and preservation of fish. Practical work under the direction of the staff of the Pacific Fisheries Experimental Station in its laboratories. Course is open to students in the Commerce - Fisheries option and in Food Technology. Mr. Tarr.

525. (2) **Problems in Systematics and Evolution**.—Seminar discussions of selected topics. Mr. Lindsey and Mr. Scudder.

526. (1) **Marine Zoogeography**.—A discussion of the factors affecting the distribution of marine organisms and the nature of the various marine zoogeographic regions. (1966-67 and alternate years.) Mr. Lewis.

527. (3) **Theoretical Population Dynamics**.—Discussion of dynamics of exploited fish populations and related theoretical population biology. Emphasis will be placed on mathematical models and their application to population problems. Mr. Wilimovsky.

528. (3) **Ichthyology A**.—A comprehensive survey of the morphology, phylogeny, palaeontology, life histories and literature of primitive fishes, including Cyclostomes, Elasmobranchs, and the soft-rayed Teleosts. Lectures, seminars and laboratory dissection. Prerequisite: Permission of the Instructor. (1965-66 and alternate years.) Mr. Wilimovsky.

529. (3) **Ichthyology B**.—A survey similar in treatment to Zoology 528 but covering primarily the Perciform fishes. Prerequisite: Permission of the Instructor. (1966-67 and alternate years.) Mr. Wilimovsky.

Note: Zoology 528 and 529 may be taken in the reverse order.

531. (2) **Ornithology**.—Phylogeny, morphology and biology of birds; factors affecting their abundance and distribution. Mr. Udvardy.

532. (2) **Mammalogy**.—Phylogeny, morphology, and biology of mammals; factors affecting their abundance and distribution. Mr. Fisher.

533. (2) **Problems in Wildlife Management**.—Mr. Cowan.

549. (6) **M.Sc. Thesis**.

649. **Ph.D. Thesis**.

Mathematics—Ph.D., M.Sc. and M.A. degrees

Ph.D. degree

Programmes of study are offered in most branches of Pure and Applied Mathematics, including Numerical Analysis. A leaflet describing opportunities for research and programme requirements is available on request from the Department.

M.Sc. or M.A. degree

Prerequisite: Honours in Mathematics, or the equivalent; or the consent of the Department.

Students interested in graduate courses should consult the Department.

501. (3) Theory of Functions of a Real Variable.
502. (3) Point Set Topology.
503. (3) Differential Geometry.
504. (3) Modern Geometry II.
505. (3) Fluid Dynamics.
506. (3) Differential Equations.
507. (3) Theory of Numbers and Algebraic Numbers.
508. (3) Theory of Rings.
509. (3) Algebra II.
510. (3) Linear Algebra.
511. (3) Topology.
512. (3) Theory of Groups.
513. (3) Continuous Groups.
514. (3) Nonlinear Differential Equations II.
515. (3) Integral Equations.
516. (3) Fourier Series and Integrals.
517. (3) Theory of Functions.
518. (3) Probability.
519. (3) Statistics.
520. (3) Numerical Analysis II.
521. (3) Functional Analysis.
522. (3) Linear Analysis and Group Representations.
523. (3) Theory of Games and Programming
524. (3) Operational Calculus.
525. (3) Celestial Mechanics.
526. (3) Dynamical Systems II.
527. (3) Theory of Elasticity.
528. (1-3) Theory of Automata.
529. (1-3) Information Processing.
530. (1-3) Topics in Algebra.
531. (1-3) Topics in Analysis.
532. (1-3) Topics in Topology.
533. (1-3) Topics in Geometry.
534. (1-3) Topics in Theoretical Mechanics.
535. (1-3) Topics in Differential Equations.
536. (1-3) Topics in Numerical Analysis.
537. (1-3) Topics in Probability and Statistics.
538. (1-3) Topics in the Foundations of Mathematics.
549. (3-6) Thesis for Master's Degree.
649. Ph.D. Thesis.

Physics—Ph.D., M.Sc. and M.A.Sc. degrees

Ph.D. degree

The Department offers opportunities for study in the following major fields:

(a) *Theoretical Physics:*

- Group theoretical aspects of elementary particles.
- Statistical mechanics of gases and solids.
- Properties of semiconducting and magnetic solids (especially group theory methods).
- Nuclear many-body problem.
- Gravitation and Mach's principle.

(b) *Biophysics:*

Studies of current interest are: (i) photochemical action spectra of cytochrome oxidases (ii) photosynthetic mechanisms mainly via action spectra (iii) electron spin resonance of hemoproteins (iv) conductance mechanisms in solid proteins and other polymers.

(c) *Magnetic Resonance:*

Spin relaxation in gases, liquids and solids; paramagnetic-antiferromagnetic phase transitions; nuclear magnetic resonance in metallic crystals; paramagnetic resonance and optical Faraday rotation; Stern-Gerlach experiment for charged particles.

(d) *Plasma Physics:*

Pinch discharges, shock waves and positive columns using optical and spectroscopic techniques and electric and magnetic probes.

(e) *Nuclear Physics:*

Facilities include a 4 MeV van de Graff generator and considerable ancillary equipment including beta-ray spectrometers and magnetic particle spectrometers.

(f) *Semiconductor Physics:*

A study of impurities in semiconductors using the techniques of infra-red and paramagnetic resonance absorption.

(g) *Low-Temperature Physics:*

Properties of liquid helium, superconductivity, phonon transport in solids, thermometry and specific heats at low temperatures.

(h) *Oceanography and Fluid Turbulence:*

Facilities are available for research in collaboration with the Institute of Oceanography.

(i) *Physical Electronics:*

Fluctuations in electrical and thermal transport processes and in photoelectric effects associated with coherent and incoherent radiation.

(j) *Spectroscopy:*

Opportunities for spectroscopic research are available using: vacuum grating, 21 ft. grating, quartz spectrographs, Perkin-Elmer infra-red spectrometer, Moll microphotometer and measuring micrometers.

A brochure describing in more detail the research facilities is available on request from the Department of Physics.

Related Subjects: Mathematics, Chemistry, Electrical Engineering and Metallurgy.

M.Sc. degree

Prerequisite: Honours in Physics and Mathematics, Physics, Mathematics, or Bachelor's degree with at least Second Class standing in Engineering or Applied Science; or satisfactory standing in Physics 200 (or Physics 155 and 156), 300 (or Physics 250), 308, 315, 400, 401, and Mathematics 402 or 410 or equivalent. (See Applied Science.)

M.Sc., M.A.Sc. and Ph.D. candidates in the Department of Physics must have their course programme approved by their Research Supervisor and the Head of the Department.

501. (2) **Elementary Quantum Mechanics.**—Non-relativistic quantum mechanics with application to atomic problems. Prerequisite: one of Physics 400, 402, 452 or equivalent.

502. (2) **Waves.**—Wave propagation in one, two, and three dimensions with consideration of reflection, refraction, diffraction, dispersion, surface coupling, wave guide phenomena, and propagation of waves in inhomogeneous and dissipative media. Principal emphasis will be on electromagnetic and acoustic waves.

503. (1) **Electromagnetic Theory.**—A deductive presentation of the classical theory of electrons and its relation to the macroscopic electromagnetic theory. Prerequisite: Physics 401 or 404.

505. (2) **Nuclear Physics.**—Interactions of radiation with matter, radioactivity, nuclear reactions, nuclear properties. Textbook: Evans, *The Atomic Nucleus*; Elton, *Introduction to Nuclear Theory*; Preston, *Physics of the Nucleus*.

506. (2) **Quantum Theory of Solids.**—An elementary treatment of the theory of the structure and properties of solids; energy band method, lattice vibrations, phonon and electron transport, dielectric and magnetic properties, imperfections.

507. (2) **Plasma Physics.**—Equilibrium theory of ionized gases, kinetic theory, transport coefficients. Motion of individual charges, cyclotron radiation. Waves, Landau damping. Derivation of magnetohydrodynamic equations.

509. (1) **Theory of Measurements.**—Probability, statistical distributions, significance tests, least squares, experimental design, numerical techniques.

510. (1) **Stochastic Processes in Physics.**—Statistical and thermodynamic fluctuations in electromagnetic, mechanical and thermal systems. Fundamental limits of observation and measurement in classical and quantum systems.

511. (1) **Advanced Magnetism.**—Spin hamiltonian, theory of ferro- and antiferromagnetism, nuclear magnetic resonance, relaxation in spin systems. Prerequisites: Physics 501 and 506.

512. (1) **Spectroscopy.**—Energy states of atoms and diatomic molecules. Textbooks: Herzberg, *Atomic Spectra and Atomic Structure*; Herzberg, *Molecular Spectra and Molecular Structure*. Prerequisite: Physics 501.

513. (1) **Crystal Structure and X-rays.**—Fundamentals of crystallography, production and properties of X-rays, structure analysis by X-rays and electron diffraction.

514. (1) **Special Relativity Theory.**—Relativistic kinematics, dynamics, connection with electromagnetic theory. Prerequisite: Physics 401 or 404.

515. (1) **Physical Electronics.**—Electronic processes in vacuo and in solids with particular reference to electron beams and semiconductors and the physical aspects of the devices derived therefrom.

516. (2) **Statistical Mechanics.**—Ensemble theory (classical and quantum mechanical). Fluctuations. Response to external perturbations. Non-equilibrium statistical mechanics. Prerequisite: Physics 403, 415 or 455.

517. (1) **Introduction to Low Temperature Physics.**—Description of cryogenic techniques insofar as these differ from normal techniques. Phenomenological aspects of low temperature physics.

518. (1) **Low Temperature Physics.**—Theoretical aspects of selected topics of interest in low temperature physics. Students enrolling in this course are expected to have a working knowledge of quantum mechanics.

519. (1) **Molecular Spectroscopy.**—Theory of Raman effect and infra-red absorption. Vibrational spectra of polyatomic molecules. Chemical applications.

520. (2) **Advanced Spectroscopy.**—Selected topics; determination of nuclear properties, microwave spectra. Textbooks: Condon and Shortley, *The Theory of Atomic Spectra*; Herzberg, *Infra Red and Raman Spectra*.

521. (2) **Group Theory Methods in Quantum Mechanics.**—Selected topics from atomic, molecular, solid state, nuclear and elementary particle physics treated by group theory methods. Prerequisites: Physics 501 (may be taken concurrently).

522. (1) **Physics of Nuclear Reactions.**—A course for those interested in reactions produced by high energy neutron and ion beams.

523. (1) **Advanced Electronics.**—Advanced treatment of problems in noise, non-linear circuit theory and information theory.

524. (1) **Waves and Antennas.**—Energy and power flow, wave impedance concept, reflection and refraction; properties of media, dispersion, propagation along the ground and via the ionosphere; antenna radiation, electromagnetic screening; plasma waves.

525. (1) **Advanced Topics In Solid State Physics.**—Theory of the structure and properties of solids, with emphasis on electronic phenomena.

526. (1) **Quantum Theory of Radiation.**—Calculation of cross-sections for absorption, emission and scattering of photons, creation and annihilation of positrons. Theory of radiation damping. Prerequisites: Physics 501, 503 and 514.

527. (1) **Theoretical Nuclear Physics.**—Selected topics from current nuclear theory. Prerequisites: Physics 501 and 505.

528. (1) **Cosmic Rays and High Energy Physics.**—Nuclear and electromagnetic interactions at very high energies. Nature and origin of cosmic rays, mesons, hyperons and anti-particles.

529. (2) **Advanced Quantum Mechanics.**—Selected topics in relativistic quantum mechanics, quantum field theory, and theories of elementary particles. Prerequisites: Physics 501 and 514.

530. (1) **General Relativity Theory.**—Primarily for students interested in theoretical physics. Prerequisites: Physics 503 and 514.

531. (1) **Advanced Plasma Physics.**—Selected topics from current research in plasma physics—seminar course.

532. (2) **Plasma Dynamics.**—The magnetohydrodynamic formulation of plasma dynamics including the effects of diffusion, viscosity, thermal conduction and ionization phenomena on plasma motion.

534. (1) **Radiological Physics I.**—A systematic study of the principles involved in radio-therapy and of the techniques required for the application of these principles.

535. (1) **Radiological Physics II.**—A continuation of Physics 534, including an extension of the topics discussed in that course.

537. (1) **Advanced Dynamic Oceanography.**—A more intensive study of the dynamics of ocean currents. Reference: Stommel, *The Gulf Stream*. Prerequisite: Oceanography 401.

538. (1) **Fluid Mechanics.**—The flow of real and ideal fluids, emphasizing the influence of turbulence and the application to ocean currents.

539. (1) **Waves and Tides.**—Surface and internal waves, tides of the oceans, tidal currents.

540. (2) **Turbulence.**—A discussion of turbulent fluid motion, presenting both the empirical aspects and the development of statistical theories, including the spectrum of turbulence and similarity and equilibrium hypotheses. Textbook: Hinze, *Turbulence*. (Offered in 1966-67 and alternate years.)

541. (1) **Dynamic Meteorology.**—Development of basic equations of motion and their application to the atmosphere. A knowledge of vector calculus is assumed.

544. (1) **Magnetic Resonance Seminar.**—Selected topics in the recent developments of the theory and applications of magnetic resonance.

545. (1) **Theoretical Physics Seminar.**—Selected topics from current literature.

549. (6) **Master's Thesis.**

555. (1-3) **Directed Studies in Physics.**—With approval of the Head of the Department, advanced studies under the direction of a staff member may be arranged in special cases.

560. (1-3) **Directed Studies in Biophysics.**—With approval of the Head of the Department, advanced studies under the direction of a staff member may be arranged in special cases.

561. (2) **Advanced Biophysics Laboratory.**—Experimental work chosen to widen the student's experience and increase his competence in a variety of biophysical research techniques.

562. (1) **Biophysics Seminar.**—Selected topics of current interest.

570. (1) **Radio Astronomy.**—Emission, propagation and detection of radio noise from the solar system, galaxy and extragalactic radio sources. This course complements E.E. 593 which deals with instrumentation for radio astronomy.

649. **Ph.D. Thesis.**

INTERDISCIPLINARY STUDIES

The Faculty of Graduate Studies encourages the realignment of traditional disciplines into new patterns, crossing department and faculty boundaries where this will foster the development of new areas of learning.

Where such interdisciplinary arrangements, by virtue of major special facilities, regional orientation or patterns of approach, take on the character of departments they may be established as Institutes within the Faculty.

Less formal arrangements may be termed Areas and the graduate study and research in these will be under the coordination of special committees of the Faculty.

Where the programme of an individual graduate student does not fit into established departmental boundaries the Dean of the Faculty may set up an ad hoc committee to plan and guide the entire programme, including the administration of the comprehensive examination and overall direction of the thesis.

Arctic and Alpine Research

There are a number of individuals at The University of British Columbia involved in research in arctic and alpine areas. A Committee on Arctic and Alpine affairs coordinates the activity, funding and mutual interests of these groups. At present the university's efforts involve high altitude alpine studies, glaciology, arctic biology, and arctic geology. The Committee sponsors lectures, provides a unified group to approach granting bodies, and provides a medium whereby interested faculty and graduate students may exchange arctic and alpine information.

Interested individuals wishing to contact this Committee or present applications for funds to work in arctic and alpine areas, should forward their request to the Dean of the Faculty of Graduate Studies for transmittal to the Committee.

Hydrology

Opportunities are available for graduate work in hydrology on a variety of programmes. Individual courses pertaining to hydrology are available in the Departments of Agricultural Mechanics, Civil Engineering, Geology, Geo-physics, Soil Science and the Institutes of Fisheries and Oceanography. Supervision of advanced work in various aspects of hydrology can be undertaken by most of these departments as well as by the Faculty of Forestry.

In some cases it may be possible for a student to complete a graduate programme entirely within the administrative framework of a single department. The field of hydrology is, however, so broad that a student may be advised to follow an interdisciplinary programme, in which case his programme may be approved and supervised by an interdepartmental committee responsible directly to the Dean of Graduate Studies.

Students seeking admission to graduate work in hydrology should apply directly to the Dean of Graduate Studies.

Urban Studies

Urban studies are the concern of several university departments. Their interests are coordinated by a Committee operating within the Faculty of Graduate Studies. The Committee sponsors seminars in which a multidisciplinary viewpoint is developed and it interests itself in facilitating research that crosses traditional departmental boundaries.

Students seeking admission to graduate work in Urban Studies should apply directly to the Dean of Graduate Studies.

COMMUNITY AND REGIONAL PLANNING

With the support of the Central Mortgage and Housing Corporation, Ottawa, the University offers a Programme in Community and Regional Planning, within the Faculty of Graduate Studies, leading to a Master's Degree. This degree will be either that of Master of Arts or of Master of Science, whichever best describes the prerequisites offered by the candidate and the courses chosen. This programme provides for the professional education of planning personnel and provides facilities and opportunities for urban and regional research.

Staff

H. PETER OBERLANDER, B.Arch. (McGill), M.C.P., Ph.D. (Harvard), A.R.I.B.A., A.M.T.P.I., M.R.A.I.C., M.T.P.I.C., Professor of Planning and Design, Director of the Programme.

KEVIN J. CROSS, B.Arch. (McGill), M.S. (Columbia), Ph.D. (Cornell), A.M.T.P.I.C., Assistant Professor of Planning.

PHILIP H. FRIEDLY, A.B., M.A., Ph.D., (S. Calif.) Assistant Professor of Planning.

ROBERT W. COLLIER, A.B., M.S., (S. Calif.), Supervisor Programmes for Planning, Department of University Extension, and Lecturer.

L. C. MARSH, B.Sc. (Econ.), (London), M.A., Ph.D. (McGill), Honorary Lecturer.

W. T. LANE, B.A., B.Com., LL.B. (Brit. Col.), Part-time Lecturer.

V. SETTY PENDAKUR, B.E. (Civil) (Mysore), M.Sc. (Planning) (Brit. Col.), M.Sc. (Civil), Ph.D. (Wash.), P.Eng., Part-time Lecturer.

An Advisory Council has been established to advise on curriculum and general teaching problems; it also provides a valuable link with current practices in Community Planning and its teaching.

Chairman of the Advisory Council

IAN MCTAGGART-COWAN, Dean of the Faculty of Graduate Studies.

Members of the Advisory Council

The Advisory Council is composed of representatives of the following agencies concerned with the problems of Planning Education in B.C.

Department of Regional Planning, Department of Municipal Affairs, Victoria.

Department of Planning, City of Vancouver.

Town Planning Commission, City of Vancouver.

Community Planning Association of Canada (B.C. Division).

The Architectural Institute of British Columbia.

The Association of Professional Engineers of B.C.

All members of the Staff, as well as the B.C. Regional Supervisor of Central Mortgage and Housing Corporation, are ex-officio members of the Council.

Prerequisites and Curriculum

Prerequisites: A Bachelor's degree with major study in: Agriculture, Anthropology, Architecture, Civil Engineering, Commerce, Economics, Fine Arts, Forestry, Geography, Law, Philosophy, Psychology, Political Science, Sociology, or Social Work. The undergraduate degree must be adequate in the range of

courses offered and academic standing obtained to admit the candidate to a Master's degree in his previous field of undergraduate study. The candidate must have taken at least three of the following courses or their equivalents, each one of which must be selected from a different area of study: Anthropology 300, 412; Agricultural Economics 403; Agricultural Plant Science 316, 416; Architecture 422, 425, 445; Civil Engineering 465, 470; Commerce 307, 309, 407; Economics 304, 309, 310, 313, 314, 321, 400, 412; Fine Arts 228, 331, 425, 431; Geography 300, 301, 304, 305, 306, 307, 310, 407, 414, 415; Political Science 300, 302, 400, 404; Sociology 306, 315, 405, 406, 425; Soil Science 314, 416.

If a candidate in addition to his prerequisites has taken courses equivalent to those described for the Master's degree he may be given credit not to exceed 12 units for those courses.

If a candidate's qualifications are not adequate he may be allowed to make up deficiencies concurrently with his Master's course provided that he does not register for more than 18 units in any one winter session. For the purpose of making good these deficiencies, courses chosen from the above list may be accepted in lieu of the courses required in the previous fields of undergraduate study. Applications for admission to the programme should be in the hands of the Director before June 1.

M.A. and M.Sc. Courses

The candidate for a Master's Degree must satisfactorily complete a programme of study approved by the Director. This programme consists of a minimum of 30 units of course work including the following: Planning 500, 501, 502, 503, 504, 510, 511, 520, 521, 522, 549, and at least three additional courses in fields allied to Community and Regional Planning such as Agricultural Economics, Architecture, Commerce, Economics, Engineering, Geography, Political Science, and Sociology. These must be courses numbered 300 and above.

The candidate who satisfactorily completes this programme of study will receive either a Master of Arts degree or a Master of Science degree, depending upon his previous training and the elective courses taken concurrently with his Master's course.

A field trip to a neighbouring urban centre is part of the complete programme of study and usually occurs in the first term. The student is expected to report on his observations. He should reserve from \$50 to \$60 to cover the expenses of this trip.

Planning 500. (3) Community Planning Workshop I.—This course and its sequels, Planning 510 and Planning 520, forms the core of the planning training and is organized as a planning workshop and seminar. Students work individually and collaboratively. During the first term emphasis is placed on the nature and evolution of the city as the most important form of human settlement. During the second term, planning projects dealing with the details of survey, analysis and design within the comprehensive planning process introduce the student to the problems of urban communities and their possible solutions.

Planning 501. (1½) Introduction to Planning Analysis.—The context within which analysis for planning takes place with regard to planning as a profession; relationship to the social sciences; the structure of the urban community; and decision-making in the urban community. The general

kinds of analysis in planning and their application to problems of the urban community.

Planning 502. (1½) Advanced Planning Analysis.—Use of the scientific method in planning decision-making. Sampling and other survey methods. Methods and techniques of analysis, prognosis, and programming in population, economic base, and land use studies.

Planning 503. (1½) Planning Engineering.—An introduction to the civil engineering aspects of community and regional planning; public services and utilities (sewerage, water supply, drainage, traffic and transportation, surveying and maps). This is a special course for students without previous engineering knowledge.

Planning 504. (1½) Urban Land Subdivision.—Each student undertakes a specific workshop problem in the detailed design of an urban residential layout. The location and characteristics of the site of the subdivision in the community are analyzed in relation to contemporary subdivision principles and standards. Various street, block, and lot patterns are considered. Alternative subdivision schemes are developed and evaluated; this leads to the preparation of sketch drawings and a report substantiating the final design proposal.

Planning 505. (1½) Traffic and Transportation Planning.—This course forms a continuity of Planning 503 and 504 but will be considered an elective for Planning students. Problems of ways and means of urban traffic and transportation systems will be examined in light of current problems and the growing body of scientific knowledge as it affects the Planning process. Planning 503 or its equivalent is a prerequisite.

Planning 506. (1½) Urban Land Planning and Economic Change.—The economic principles governing the structure, growth, and development of urban economies. The theory of market and public planning allocations of land resources in urban areas. Provincial and local government planning for urban land development; analytical methods, current experience, and welfare implications with examples from the developed and developing countries.

Planning 510. (2) Community Planning Workshop II.—An existing urban area or community is investigated in detail, including comprehensive surveys and analysis of physical, social, economic, and political aspects. This enables the students working both as individuals and teams to develop policy recommendations and plans within the framework of an overall programme for the community, as a solution to its current and anticipated problems. A comprehensive Project Report is prepared by the students.

Planning 511. (1) Urban Renewal Seminar.—Federal, Provincial and local objectives, and programmes in the areas of urban development, rehabilitation, conservation, and public housing are reviewed. The experiences of Canada and the U.S.A. are emphasized. Current problems and trends are discussed. Student research reports are utilized as a basis for the seminar.

Planning 520. (3) Regional Planning Workshop.—This course forms the continuity to Planning 510 and lasts the second term only. Students will work collaboratively and individually on problems in regional planning and resource development.

Planning 521. (1½) Regional Planning Theory, Methods and Techniques.—The principles, problems, methods and techniques of planning for areas larger than a city; metropolitan areas, resource development programmes for the rapidly developing countries of the world, including river basin

regions. Theory of regions, principles of regional economic development, techniques of resource analysis and regional planning; financing regional development.

Planning 522. (1½) Local and Regional Planning Administration.—Planning as a function of government; methods and techniques of implementing a comprehensive development plan through land use controls, by-laws and administrative procedures; problems of governmental jurisdiction; regional authorities and commissions.

Planning 549. (3) Master's Thesis.—The fall term is organized as a seminar, and is spent examining selected references on the significance and scope of research into urban and regional planning theory and methods. Concurrently, the individual student selects his thesis topic and formulates his study hypothesis and thesis outline. During the spring term the individual student undertakes relevant research and field work, and completes the thesis. A Thesis Committee approves the student's selection of the thesis topic, reviews progress periodically, and conducts the final oral examination on the project. Credit is given for the course upon acceptance of the Thesis.

1966-67

INSTITUTE OF EARTH SCIENCES

The Institute of Earth Sciences was established at the University of British Columbia in the summer of 1961. The Institute is part of the Faculty of Graduate Studies and is primarily concerned with research in Geophysics. It is advised by a committee representing a number of co-operating departments and supporting organizations. The growth of Geophysics as a science has been everywhere exceedingly rapid. The new importance of space research with rockets and satellites and the increasing interest in the development of the Arctic and Antarctic regions have given additional emphasis to the practical aspects of the subject which formerly were solely concerned with prospecting for oil and minerals. The need for trained personnel and for the products of their research is especially important in Canada which has an economy largely based on natural resources.

At present the two main fields of research of the Institute are geomagnetism and isotopic studies; some work is also done in seismology and gravity. In geomagnetism both experimental and theoretical investigations are being carried out on micropulsations of the Earth's electromagnetic field. Combined field operations are conducted with other institutions—in particular with the Pacific Naval Laboratory, Esquimalt. Research is also carried out in other broader aspects of geomagnetism and solar-terrestrial relationships.

Isotopic studies continue to represent a major interest of the Institute. Considerable success has been achieved in making precise intercomparisons of lead isotope abundances. Work has also started on potassium-argon and strontium-rubidium measurements.

The mode of flow of the Athabasca Glacier has been studied and similar work will continue. Members of the Institute have also taken part in glaciological expeditions in the Arctic. Seismological investigations have been carried out in the field on problems of crustal thickness and model studies have been initiated in the laboratory. Further details of the research carried out by the Institute may be found in the latest Annual Report.

Staff

- J. A. JACOBS, M.A., Ph.D., D.Sc. (London), F.R.A.S., F.R.S.C., Professor and Head of the Department of Geophysics and Director of the Institute.
- IAN McTAGGART COWAN, B.A. (Brit. Col.), Ph.D. (California), F.R.S.C., Professor, Department of Zoology, and Dean of the Faculty of Graduate Studies.
- W. D. FINN, B.E. (Nat. Univ. Ireland), M.Sc., Ph.D. (Washington), Assoc. M.Am.Soc.C.E., M.A.S.E.E., Professor and Head of the Department of Civil Engineering.
- J. ROSS MACKAY, B.A. (Clark), M.A. (Boston), Ph.D. (Montreal), F.R.S.C., Professor, Department of Geography.
- WM. H. MATHEWS, M.A.Sc. (Brit. Col.), Ph.D. (Calif.), F.G.S.A., F.R.S.C., Cominco Professor and Head of the Department of Geology.
- GEORGE L. PICKARD, M.B.E., M.A., D.Phil. (Oxon.), Professor, Department of Physics, and Director of the Institute of Oceanography.
- C. A. ROWLES, M.Sc. (Sask.), Ph.D. (Minnesota), Professor and Chairman of the Department of Soil Science.
- M. CAPUTO, Ph.D. (Ferrara), Ph.D. (Bologna), Libera Docenza in Geodesia (Ministry of Education, Rome), Associate Professor.

Geophysics cuts across many disciplines—physics, chemistry, geology, engineering and the restriction of activities to any one of these fields severely hampers progress. However, geophysics cannot be properly studied without a thorough knowledge of mathematics, physics and chemistry. Seven courses are offered at the undergraduate level.

A student desiring to pursue graduate work in one of the fields of research in the Earth Sciences should discuss his programme with the Director of the Institute.

Geophysics 501. (2) Advanced Geophysics.—A detailed discussion of the constitution of the Earth as deduced from seismic, magnetic, gravimetric and thermal studies.

Geophysics 502. (2) Principles of Earth Science.—A detailed discussion of geological evidence bearing on graduate research in the Geophysics Department. Prerequisite: consent of instructor.

Geophysics 511. (1-2) Seismology.—Theory of seismic waves and seismographs; focal mechanism, magnitude, and statistics of earthquakes; interpretation of surface wave dispersion curves.

Geophysics 512. (1-2) Geomagnetism and Aeronomy.—Transient variations, magnetic storms, and ionospheric disturbances.

Geophysics 513. (1-2) Radioactive and Isotopic Processes in Geophysics.—Modern methods of geochronology and the application of mass spectrometry to geological studies.

Geophysics 514. (1-2) Geophysical Analysis.—A discussion of the analysis and interpretation of geophysical phenomena; analytical treatment, numerical procedures, and application of statistical methods.

Geophysics 515. (1-2) Cosmology.—Stellar models, radiometric dating of extraterrestrial events, cosmochemistry and related topics.

Geophysics 520. (1-3) Directed Studies in Geophysics.

Geophysics 521. (1) Modern Aspects of Geophysics.—A seminar course.

Physics 502. (2) Waves.—Wave propagation in one, two, and three dimensions with consideration of reflection, refraction, diffraction, dispersion, surface coupling, wave guide phenomena, and propagation of waves in inhomogeneous and dissipative media. Principal emphasis will be on electromagnetic and acoustic waves.

In addition, the Institute of Oceanography provides a broad programme of training in marine sciences, and other courses in geology, chemistry, mathematics, physics and engineering may be required or recommended.

INSTITUTE OF FISHERIES

The Institute of Fisheries is a part of the Faculty of Graduate Studies primarily concerned with research and teaching in all aspects of fisheries biology. The University of British Columbia is fortunately located for both freshwater and marine fisheries investigation. Federal, provincial and international government agencies conduct active research and management programmes in the immediate area and contribute to the training programme at the Institute. The fishing industry of the province actively supports the Institute's activities.

Research facilities at the University include freshwater and marine aquaria, specialized equipment for physiology and behavioral studies as well as equipment for field investigations. The fish museum possesses an extensive collection of Canadian freshwater and marine species plus recent acquisitions from Alaska, the tropical Eastern Pacific, Japan, and the Malaysian region. The limnological collection, in addition to standard physical and chemical information, contains a large number of plankton and bottom fauna samples from several hundred lakes in British Columbia. Thus, abundant material is provided for investigations in systematics, including the comparative anatomy, phylogeny, and distribution of fishes. The Institute also maintains library facilities for studies of this type. The Vancouver Public Aquarium provides space for research in its laboratories and has available for study a wide variety of tropical and temperate, marine and freshwater species.

Various University departments cooperate in providing courses for fisheries students. Most emphasis is in zoology, but to provide broad understanding of the use of fisheries resources, special courses are offered in economics, law, commerce, engineering, nutrition and other related fields. In addition, the Institute of Oceanography provides a broad programme of training in marine sciences.

The Technological Station of the Fisheries Research Board of Canada cooperates with the Institute in providing training at a graduate level for a limited number of graduate students interested in advanced biochemistry in relation to fish processing.

A student desiring to undertake graduate work in Fisheries should discuss his programme with the Director of the Institute of Fisheries.

Staff

NORMAN J. WILIMOVSKY, M.A. (Michigan), Ph.D. (Stanford), Professor and Director of the Institute of Fisheries.

W. S. HOAR, B.A. (New Brunswick), M.A. (Western Ontario), Ph.D. (Boston), F.R.S.C., Professor, Department of Zoology.

C. C. LINDSEY, B.A. (Toronto), M.A. (Brit. Col.), Ph.D. (Cantab.), Associate Professor and Curator, Department of Zoology.

I. E. EFFORD, B.Sc. (London), D.Phil. (Oxon.), Associate Professor, Department of Zoology.

J. T. MCFADDEN, B.S. (Pittsburgh), M.S. (Ohio State), Ph.D. (Penn. State), Assistant Professor, Department of Zoology.

T. G. NORTHCOTE, M.A., Ph.D. (Brit. Col.), Assistant Professor, Part-time, Department of Zoology.

G. F. CURTIS, Q.C., LL.B. (Sask.), B.A., B.C.L. (Oxon.), LL.D. (Dalhousie, Sask.), Professor, Faculty of Law.

E. S. PRETIUS, B.A.Sc. (Brit. Col.), M.Sc. (Iowa), Assoc.M.Soc.C.E., Professor, Department of Civil Engineering

H. B. HAWTHORN, M.Sc., B.A. (New Zealand), Ph.D. (Yale), F.R.S.C., Professor, Department of Anthropology and Sociology.

A. D. SCOTT, B.Com., B.A. (Brit. Col.), M.A. (Harvard), Ph.D. (London), Professor, Department of Economics and Political Science.

H. L. A. TARR, B.S.A., M.S.A. (Brit. Col.), Ph.D. (McGill and Cambridge), Director Pacific Fisheries Experimental Station, Fisheries Research Board of Canada, Honorary Lecturer.

The following courses are available and others may be arranged to meet the needs of individual students:

Fisheries 500. (1) Fisheries Law.—A seminar course on the law governing fisheries and fisheries problems, with special reference to international aspects. (1966-67 and alternate years.) Mr. Curtis.

Fisheries 501. (1) Hydraulics.—A seminar course designed to acquaint the student with some hydraulic problems related to fisheries conservation. (1967-68 and alternate years.) Mr. Pretious.

Fisheries 502. (1) Anthropology.—A seminar course on the introduction of new techniques and knowledge in fisheries and related fields to non-industrialized societies, including a study of the cultural backgrounds in relation to the technical programmes of international organizations. Prerequisite: Anthropology 200. (1967-68 and alternate years.) Mr. Hawthorn.

Fisheries 503. (1) Economics.—A seminar course on the economics of natural resources with special reference to fisheries. It is recommended that students take Economics 408 as a prerequisite. (1966-67 and alternate years.) Mr. Scott.

Zoology 520. (3) Limnology.—Physical, chemical and biological factors of lakes and streams in relation to productivity. Prerequisites: Zoology 301, 415. (1966-67 and alternate years.) Mr. Northcote.

Zoology 521. (3) Fisheries Biology and Management.—Description of world fisheries and discussion of population problems pertinent to commercial and game fishes with review of techniques of management of fish stocks. Prerequisites: Zoology 415. Mr. Wilimovsky.

Zoology 522. (2) Limnology Seminar.—A seminar and reading course on recent advances in limnology. Prerequisite: Zoology 520 or by special arrangement. (1967-68 and alternate years.) Mr. Northcote.

Zoology 523. (1) Fisheries Technology.—Handling, preparing and preservation of fish. Practical work under the direction of the Staff of the Pacific Fisheries Experimental Station in its laboratories. Course is open to students in Commerce—Fisheries option, and in Food Technology. Mr. Tarr.

Zoology 525. (2) Problems in Systematics and Evolution.—Seminar discussions on selected topics. Mr. Lindsey and Mr. Scudder.

Zoology 526. (1) Marine Zoogeography.—A survey of the various marine zoogeographic regions with an examination of the distribution of representative groups of marine animals. (1966-67 and alternate years.) Mr. Bary.

Zoology 527. (3) Theoretical Population Dynamics.—Discussion of dynamics of exploited fish populations and related theoretical population biology. Emphasis will be placed on mathematical models and their application to population problems. Mr. Wilimovsky.

Zoology 528. (3) Ichthyology A.—A comprehensive survey of the morphology, phylogeny, paleontology, life histories and literature of primitive fishes, including Cyclostomes, Elasmobranchs, and the soft-rayed Teleosts.

Lectures, seminars and laboratory dissection. Prerequisite: permission of instructor. (1966-67 and alternate years.) Mr. Wilimovsky.

Zoology 529. (3) Ichthyology B.—A survey similar in treatment to Zoology 528 but covering primarily the Perciform fishes. Prerequisite: permission of instructor. (1967-68 and alternate years.) Mr. Wilimovsky.

Note: Zoology 528 and 529 may be taken in the reverse order.

Other courses which may be required or recommended include those listed in the programmes of the Department of Zoology, Department of Botany, and the Institute of Oceanography.

1966-67

INSTITUTE OF INDUSTRIAL RELATIONS

The Institute of Industrial Relations was set up in 1960 to encourage research in the broad field of industrial relations. Included within the scope of Institute studies are manpower analysis, collective bargaining studies, and the study of human relations issues as well as economic and social analyses of these areas. The Institute supports studies of industrial relations at graduate and faculty levels. Community activities have also been undertaken.

The programme is interdisciplinary in character. In cooperation with various departments of the University, the Institute endeavours to support many and varied areas of specialized research into industrial relations. Fellowships are provided for graduate students carrying on studies in the Social Science Departments of the Arts Faculty as well as in the Faculties of Law and Commerce. Faculty members carrying on research work are drawn from the faculty of the University.

Information with respect to course work of fellowships may be secured through the Director of the Institute.

Staff

J. Tait Montague, B.A. (Western Ontario), M.A., Ph.D. (Toronto), Professor of Economics and Director of the Institute of Industrial Relations.

Noel A. Hall, B.Com. (Brit. Col.), M.B.A. (Calif.), D.B.A. (Harvard), Associate Professor of Commerce and Business Administration and Chairman of the Division of Industrial Administration.

Oivind Hansen, M.A. (Oslo), Visiting Assistant Professor of Sociology.

Gideon Rosenbluth, B.A. (Toronto), Ph.D. (Columbia), Professor of Economics.

John Vanderkamp, B.Ec.Sc. (Amsterdam), M.B.A. (Toronto), Ph.D. (London), Assistant Professor of Economics.

Credit courses dealing with industrial relations issues are offered in Economics, Commerce, Law, Sociology and Psychology. Industrial relations is recognized as a field for specialization in appropriate courses of graduate studies. Degree requirements of the Faculties are listed elsewhere in this calendar.

The following courses are offered at the graduate level by the Departments indicated:

Economics Department*

Economics 507. (3) Labour Economics.—Wage theory; determinants of wage rates in organized and unorganized labour markets; collective bargaining and industrial conflict; impact of union policies on general economic stability and economic growth.

Economics 607. (3) Comparative Industrial Relations Systems.—Organization, structure and policies of labour movements and employer groups in major industrial countries; comparative analysis of collective bargaining and industrial conflict; labour and economic development.

Anthropology and Sociology*

Graduate training in the field of Industrial Sociology is provided through Sociology seminars 521 and 522.

Psychology* 515. (3) Industrial Psychology.

Commerce and Business Administration*

Commerce 520. (1½) Organizational Behaviour and Administration.—An examination of problems and issues in the administration of human resources in business organizations. The course will concentrate on specific behavioural and attitudinal problems which face the practicing manager. Concepts, theory and research from various social sciences will be presented in analyzing determinants of and possible solutions to the problems.

Commerce 521. (1½) Theory, Research and Methodology in the Study of Organizational Behaviour.—An attempt to identify and integrate various theoretical frameworks utilized in the study of behaviour in business organizations. Major empirical research findings will be reviewed in the light of the theoretical viewpoints discussed. Concomitantly, key methodological approaches and problems in behavioural research in business organizations will be illustrated.

Commerce 522. (1½) Selected Problems in Labour Relations.—An examination of contemporary problems of labour relations, with particular emphasis on public policy issues, conciliation, and arbitration procedures, the process of labour-management accommodation to technological change, the status of unions in society and their impact on the management of industrial and commercial enterprises.

Commerce 523. (1½) Seminar in Labour Relations—An examination of major research findings in selected areas of labour relations with particular reference to the growth and potential of labour unions, their impact on management, disputes settlement, public policy issues in labour-management relations and internal union structure.

Law

Law 315. Labour Law.—Two hours per week, fall term. Union-management relations; the collective bargaining process; the collective agreement, arbitration and conciliation procedure. The relationship between the union and its members.

Seminars (Law 331). Special Problems in Labour Law. An examination of concrete examples of problems of contract formation; specific problems in collective agreement observance. Participants in the seminar will be provided with evidence and argument relating to the range of problems which arbitration boards are called upon to consider and will produce and defend solutions to them.

*All Departments listed above entertain submissions for thesis work in the broad field of labour, usually under a course headed 549 for M.A. thesis, and 649 for Ph.D. thesis. In addition, most departments have a directed study course under which further work in the labour field can be undertaken.

INSTITUTE OF OCEANOGRAPHY

The Institute of Oceanography was established at the University of British Columbia in the fall of 1949, and is a part of the Faculty of Graduate Studies. It is supported in part by the National Research Council, by the Defence Research Board, and by the Canadian Committee on Oceanography which represents the interests of the federal departments concerned with the sea.

The increasing interest in the problems of the sea has created a demand in Canada for trained scientists to undertake oceanographic investigations. The Institute represents the cooperative effort of the Departments of Botany, Chemistry, Geology, Geography, Physics and Zoology to train graduate students in one or more of these branches in the principles and techniques of oceanographic research.

The Institute is further charged with the responsibility for fundamental research in oceanography. Its location is particularly suited to this purpose. The fjords of British Columbia present special features which facilitate the study of water properties under restricted conditions. The large volume of fresh water discharged into the Strait of Georgia from the Fraser River represents an estuarine condition which is amenable to detailed study. The strong tidal currents typical of many channels along the coast provide opportunities for the investigation of turbulent mixing. Easy access to the open ocean is obtained through Juan de Fuca Strait.

The wide ranges of salinity and concentration of plant nutrients present special problems in the chemistry of seawater and establish a variety of environmental conditions reflected in the diversified fauna and flora of the region.

The relationships between species and populations of planktonic organisms and their environment offer problems basic to understanding principles in ecology and distribution of these organisms in the sea. The variety of environments available and of the planktonic species ensures rewarding investigations into problems of broad application.

The importance of the sea in the economy of the Pacific Coast forecasts an increasing industrial application of oceanography.

Opportunity for investigation, observation and collection at sea is available to the staff and students of the Institute through the facilities and research ships of the Pacific Oceanographic Group and the Pacific Naval Laboratory.

The phycological herbarium, which is housed in the Biological Sciences Building, comprises over 17,000 specimens of marine algae. It is rich in species from British Columbia, Washington, Oregon and Alaska as a result of the collections made by staff and students of the Institute of Oceanography in research projects supported by the National Research Council and the Defence Research Board.

A student wishing to do graduate work in oceanography should first discuss his proposed programme with the Director. Students in oceanography are required to take Oceanography 400, 401, 402 and 403 unless they have previously taken equivalent courses. Students in the biological sciences will substitute Oceanography 506 and/or 507 for Oceanography 403. Additional courses to complete the student's programme will be chosen in consultation with his supervisor or supervising committee.

Staff

G. L. PICKARD, M.B.E., M.A., D.Phil. (Oxon.), F.R.S.C., Director.

W. H. MATHEWS, M.A.Sc. (Brit. Col.), Ph.D. (Calif.), F.G.S.A., F.R.S.C., Professor.

R. W. STEWART, M.Sc. (Queen's), Ph.D. (Cantab.), Professor.

R. F. SCAGEL, M.A. (Brit. Col.), Ph.D. (California), F.R.S.C., F.L.S., Professor; Assistant Dean of the Faculty of Science.

B. MCK. BARY, M.Sc., Ph.D. (New Zealand), Professor.

R. W. BURLING, M.Sc. (New Zealand), Ph.D. (London), Associate Professor.

G. C. HUGHES, M.Sc., Ph.D. (Florida State), Assistant Professor.

P. M. LEBLOND, B.A. (Laval), B.Sc. (McGill), Ph.D. (Brit. Col.), Assistant Professor.

E. V. GRILL, B.Sc. (Ohio State), M.Sc., Ph.D. (Wash.), Assistant Professor.

A. G. LEWIS, B.Sc., M.Sc. (Miami), Ph.D. (Hawaii), Assistant Professor.

J. W. MURRAY, B.Sc. (Alberta), M.A., Ph.D. (Princeton), Assistant Professor.

F. J. R. TAYLOR, B.Sc., Ph.D. (Capetown), Assistant Professor.

Courses are offered in the following fields:

General Oceanography

Oceanography 400. (1) Introduction to Synoptic Oceanography.—Survey of oceanic circulation, distribution of temperature and salinity, energy budget. Textbook: Pickard, *Descriptive Physical Oceanography*. Mr. Pickard.

Oceanography 501. (1) Advanced Synoptic Oceanography.—Detailed study of the ocean water masses with emphasis on specific and recent studies. Prerequisites: Oceanography 400 and 401. Mr. Pickard.

Oceanography 503. (1) Oceanographic Methods.—Oceanographic instrumentation, design of experiments, processing and analysis of data. Staff.

Oceanography 505. (1-3) Special Advanced Courses.—A special advanced course may be arranged for a student upon approval of the Director of the Institute.

Biological Oceanography

Oceanography 403. (1) Introduction to Biological Oceanography.—Occurrences and distribution of marine plants and animals in relation to oceanographic factors. For students other than those in the biological sciences. Prerequisite: Oceanography 400. Mr. Bary and Mr. Taylor.

Oceanography 506. (1) Phytoplankton Ecology.—Oceanographic factors in relation to the distribution of marine phytoplankton. Prerequisite: Oceanography 400. Mr. Taylor.

Oceanography 507. (1) Zooplankton Ecology.—A study of marine zooplankton, the interrelationships of the species, their biology and relations to the environment. Prerequisite: Oceanography 400. Mr. Bary.

Botany 510. (3) Marine Phycology.—Collection, identification, ecology and life histories of algae; emphasis on marine benthonic forms. Prerequisite: Botany 411. (Offered in 1967-68 and alternate years.) Mr. Scagel.

Botany 512. (2) Marine Phytoplankton.—Collection, identification and quantitative analysis of marine phytoplankton in relation to oceanographic factors. Prerequisites: Botany 411, Oceanography 400. (Offered in 1967-68 and alternate years.) Mr. Taylor.

Botany 517. (3) Marine Mycology.—Structure, classification, culture, and physiology of marine and brackish water fungi. Special problems on groups or individual species. (Offered in 1967-68 and alternate years.) Mr. Hughes.

Zoology 511. (2) Advanced Marine Zooplankton.—Studies of marine zooplankton including systematics, life histories, and ecology and distribution as determined by relations to the environment. Prerequisites: Zoology 301, Oceanography 400. (Offered in 1966-67 and alternate years.) Mr. Bary.

Chemical Oceanography

Oceanography 402. (1) Introduction to Chemical Oceanography.—The composition of sea water, biochemical and chemical factors affecting its variation, determination of selected constituents. Mr. Grill.

Oceanography 502. (1) Advanced Chemical Oceanography.—Selected topics in the marine geochemistry of organic and inorganic constituents of sea water. Mr. Grill.

Geological Oceanography

Oceanography 404. (1) Introduction to Geological Oceanography.—A discussion of the topographic features of the ocean floor and continental margins, the origin and distribution of sediments in the oceans and the use of foraminifera in the study of the oceans. Techniques and methods in geological oceanography will be outlined. Mr. Murray.

Geology 519. (1½) Seminar in Sedimentology.—Principles of sedimentation as applied to modern and ancient deposits. Mr. Mathews.

Geology 520. (1½) Problems in Sedimentology.—Directed laboratory study in problems of sedimentology. Prerequisite: Geology 401. Mr. Mathews.

Physical Oceanography and Meteorology

Oceanography 401. (1) Introduction to Dynamic Oceanography.—A survey of the physical properties of sea water, hydrostatics, continuity, geostrophic and wind-driven currents, waves and tides, eddy diffusion. Mr. Burling and Mr. Pickard.

Physics 441. (1) Introductory Meteorology.—Instruments, observations and their presentation. Synoptic patterns. Basic dynamics and thermodynamics of the atmosphere. Water vapour and cloud formation. Radiation. Prerequisites: One of Physics 156, 200, 204 or equivalent. Mathematics 202 or equivalent.

Physics 537. (1) Advanced Dynamic Oceanography.—A more intensive study of the dynamics of ocean currents. References: Stommel, *The Gulf Stream*. Prerequisite: Oceanography 401. Mr. Burling and Mr. Stewart.

Physics 538. (1) Fluid Mechanics.—The flow of real and ideal fluids, emphasizing the influence of turbulence and the application to ocean currents.

Physics 539. (2) Waves and Tides.—Surface and internal waves, tides of the oceans, tidal currents. Mr. Burling, Mr. LeBlond and Mr. Stewart.

Physics 540. (2) Turbulence.—A discussion of turbulent fluid motion, presenting both the empirical aspects and the development of statistical theories, including the spectrum of turbulence and similarity and equilibrium hypotheses. Text: Hinze, *Turbulence*. (Offered in 1966-67 and alternate years.) Mr. Stewart.

Physics 541. (1) Dynamic Meteorology.—Development of basic equations of motion and their application to the atmosphere. Prerequisite: Vector calculus.

REGISTRATION IN THE FACULTY OF GRADUATE STUDIES,

December 1965

Department	Degree	Total
Agricultural Economics.....	M.S.A.	2
Agricultural Extension.....	M.S.A.	4
Agricultural Mechanics.....	M.S.A.	3
Agricultural Microbiology.....	M.Sc.	4
	M.S.A.	1
	Ph.D.	3
Anatomy	M.Sc.	2
	Ph.D.	1
Animal Science.....	Ph.D.	2
	M.S.A.	5
	M.Sc.	2
Anthropology.....	M.A.	12
	Ph.D.	4
Architecture	M.Arch.	2
Asian Studies.....	M.A.	8
Biochemistry.....	M.Sc.	4
	Ph.D.	12
Biology and Botany.....	M.Sc.	18
	Ph.D.	19
Chemical Engineering.....	M.A.Sc.	9
	Ph.D.	6
Chemistry.....	M.Sc.	36
	Ph.D.	82
Civil Engineering.....	M.A.Sc.	18
	Ph.D.	6
Classics.....	M.A.	8
	Ph.D.	4
Commerce.....	M.B.A.	54
Community and Regional Planning.....	M.A.	16
	M.Sc.	9
Economics.....	M.A.	21
	Ph.D.	5
Education.....	M.A.	23
	M.Ed.	36
	Ed.D.	10
Electrical Engineering.....	M.A.Sc.	29
	Ph.D.	19
Engineering Physics	M.A.Sc.	7
	Ph.D.	3

Department	Degree	Total
English.....	M.A.	91
	Ph.D.	19
Fine Arts.....	M.A.	9
	M.F.	10
Forestry.....	Ph.D.	14
	M.A.	25
Geography.....	Ph.D.	12
	M.A.Sc.	1
Geological Engineering.....	M.Sc.	15
Geology.....	Ph.D.	14
	M.Sc.	12
Geophysics.....	Ph.D.	8
	M.A.	20
German.....	Ph.D.	3
	M.A.	19
History.....	Ph.D.	14
	LL.M.	1
Law	M.A.	5
Linguistics	M.A.	32
Mathematics.....	M.Sc.	3
	Ph.D.	28
	M.A.Sc.	15
Mechanical Engineering.....	Ph.D.	6
	M.Sc.	4
Metallurgy.....	M.A.Sc.	17
	Ph.D.	18
	M.Sc.	3
Microbiology	M.A.Sc.	2
Mining	M.Mus.	2
Music	M.S.P.	8
Pharmacy.....	M.Sc.	1
	Ph.D.	2
Pharmacology.....	M.A.	18
	Ph.D.	4
Philosophy.....	M.P.E.	11
Physical Education.....	M.Sc.	47
	Ph.D.	68
Physics.....	M.Sc.	1
Physiology.....	M.S.A.	10
Plant Science.....	M.Sc.	2
	Ph.D.	4

Department	Degree	Total
Political Science.....	M.A.	11
	Ph.D.	1
Poultry Science.....	M.S.A.	2
	M.Sc.	1
	Ph.D.	5
Psychology.....	M.A.	29
	Ph.D.	8
Romance Studies.....	M.A.	26
	Ph.D.	6
Slavonic Studies.....	M.A.	17
Sociology.....	M.A.	17
	Ph.D.	3
Soil Science.....	M.Sc.	1
	M.S.A.	1
	Ph.D.	2
Theatre	M.A.	2
Zoology.....	M.Sc.	71
	Ph.D.	49
		Total 1,359

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Agricultural Economics	O15	History	O39
Agricultural Extension	O15	Horticulture	O17
Agricultural Mechanics	O15	Hydrology	O83
Agronomy	O16	Institute of Earth Sciences	O88
Anatomy	O63	Institute of Fisheries	O90
Animal Science	O16	Institute of Industrial Relations	O93
Anthropology	O33	Institute of Oceanography	O95
Architecture	O32	Interdisciplinary Studies	O83
Arctic and Alpine Research	O83	Italian	O40
Asian Studies	O33	Latin (see Classics)	O40
Biochemistry	O60 & O72	Law	O57
Botany	O73	Mathematics	O77
Chemical Engineering	O19	Mechanical Engineering	O26
Chemistry	O67	Metallurgical Engineering	O28
Civil Engineering	O20	Metallurgy	O29
Classics	O34	Microbiology	O74
Commerce and Business Administration	O47	Mineral Engineering	O30
Community and Regional Planning	O84	Music	O40
Dairying	O16	Neurology	O61
Dairying and Soil Science	O16	Pharmacology	O61
Economics	O35	Pharmacy	O65
Education	O50	Philosophy	O41
Electrical Engineering	O24	Physical Education	O66
Engineering Physics	O26	Physiology	O62
English	O36	Physics	O79
Fine Arts	O37	Plant Science	O17
Forestry	O55	Political Science	O42
French	O37	Poultry Science	O17
Genetics	O16 & O70	Psychiatry	O62
Geography	O38	Psychology	O43
Geological Engineering	O26	Romance Studies	O44
Geology	O70	Slavonic Studies	O44
Geophysics	O71	Sociology	O45
German	O39	Soil Science	O18
Greek	O39	Spanish (see Romance Studies)	
		Urban Studies	O83
		Zoology	O75

1966-67

**THE FACULTY
OF
LAW**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**



The Faculty of Law calendar, 1966-67

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ACADEMIC STAFF

GEORGE F. CURTIS, Q.C., LL.B. (Sask.), B.A., B.C.L. (Oxon.), LL.D. (Dalhousie, Saskatchewan), D.C.L. (New Brunswick), Professor and Dean of the Faculty.

CHARLES B. BOURNE, B.A. (Toronto), LL.B. (Cantab.), Professor.

ERIC C. E. TODD, LL.B., LL.M. (Manchester), Professor.

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M. A. HICKLING, M.A., LL.B., Ph.D. (London), Associate Professor.

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J. C. SMITH, B.A., LL.B. (Brit. Col.), LL.M. (Yale), Assistant Professor.

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HAROLD A. HOLLINRAKE, LL.B. (Brit. Col.), Lecturer on Insurance.

G. R. SCHMITT, B.A., LL.B. (Sask.), LL.M. (Harvard), Lecturer on Insurance.

W. D. C. TUCK, LL.B. (Brit. Col.), Lecturer on Shipping.

A. WATTS, Q.C., A.F.C., E.D., B.Com. (Brit. Col.), Honorary Liaison Secretary.

PRESIDENT EMERITUS N. A. M. MACKENZIE, Honorary Professor of Public International Law.

FREDERICK READ, LL.B. (Man.), Professor Emeritus of Law (1950).

MRS. DOREEN INGRAM, B.A., B.L.S. (McGill), Librarian.

Lecturers from other Departments:

A. BEEDLE, B.Com. (London), C.A., Associate Professor, Faculty of Commerce and Business Administration, Lecturer in Accounting.

FACULTY OF LAW

General

The Faculty of Law was established in 1945. The present building, opened in 1951, contains a library of approximately 50,000 volumes, one of the finest law libraries in Canada. The library consists of substantially all the Canadian and English materials, the major United States reports, wide holdings of Commonwealth and foreign texts and periodicals, and a substantial collection of International Law materials. The University is also a repository for United Nations publications.

Degrees

The Faculty of Law offers two degrees, Bachelor of Laws (LL.B.) and Master of Laws (LL.M.). Information concerning the LL.M. degree may be found in the Graduate Studies Calendar. The Bachelor of Laws degree is granted on the successful completion of a three-year course, and prepares students for admission to the practice of law (subject to further requirements which are set out below) and for business and public service.

Admission: (i) *Application*

It is recommended that those planning to enter the Faculty of Law interview a member of the Faculty as early as possible.

Application for entry to the Law School must be made to the Registrar of the University as early as possible in the year and in any event not later than July 31. An applicant should procure an application form from the office of the Registrar so that he can have it completed and returned on or before that date.

Applicants must submit to the Registrar two recent passport-type photographs of themselves, endorsed with their names, at the time of their first application for admission to the Faculty (in addition to those required on first admission to the University).

(ii) *Academic Requirements*

Applicants must present evidence of having:

- (a) graduated in an approved course of studies from the University of British Columbia and obtained a degree standing of not less than 60%; or obtained the equivalent at an approved university; or
- (b) successfully completed the first three years of the course leading to the degree of Bachelor of Arts in the University of British Columbia and obtained at the regular sessional examinations in the Third Year thereof an average of not less than 65%; or obtained the equivalent at an approved university; or
- (c) successfully completed the requirements of the Faculty of Commerce and Business Administration in the combined B.Com., LL.B. course in the University of British Columbia and obtained at the regular sessional examinations in the Third Year thereof an average of not less than 65%.

(iii) *Advanced Standing*

Undergraduates in other faculties or schools of law may, upon application, be granted such standing as the Faculty may determine.

The provisions of (ii) and (iii), above, are subject to these qualifications:

- (i) The Faculty has power to deal with special cases.
- (ii) A candidate who, notwithstanding his academic record, is in the opinion of the Admissions Committee deficient in English, will be refused admission.

- (iii) A candidate who has failed or has deficient standing in any year of a law course at another institution must, unless the Admissions Committee determines otherwise because of very exceptional circumstances, obtain full standing in that year before he will be considered for admission, for repetition or otherwise, to the Faculty of Law.
- (iv) The Faculty reserves the right to reject applicants for admission on the basis of their overall academic record even if they technically meet entrance requirements.

Fees (*Subject to change without notice*)

First Term Fees, \$282 (includes A.M.S. fee), are payable in full at the time of registration. Third Year students are assessed an additional \$7 (\$289) to cover the graduation fee.

Second Term Fees, \$253, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Students may if they wish pay the total fees of \$535 at the time of registration.

Graduate Studies

For the graduate programme in Law leading to the degree of LL.M. see the Faculty of Graduate Studies calendar.

General University Regulations

General University regulations concerning discipline, health, and other matters as detailed in the General Information bulletin are applicable to students in the Faculty of Law.

Registration

Registration will take place in the Law Building on the first day of lectures. No student will be allowed to register after the first day of instruction in the term, nor will he be admitted to any class after its first meeting, except by permission of the Dean.

Attendance

Regular attendance is expected of students in all their classes (including lectures, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Examinations (i) *General*

Examinations will be held in April at the close of each session except in respect of those subjects which are given in the First Term only, when examinations will be held immediately prior to the Christmas vacation.

A student, in order to pass his year, must obtain an average of not less than 55 per cent. on the work of that year. No supplemental examinations will be granted or held. Successful candidates will be graded as follows:

First Class, an average of 80 per cent. or over; Second Class, 65 to 80 per cent.; Pass, 55 to 65 per cent.

Term essays and examination papers may be refused a passing mark if they are illegible or deficient in English.

A student who fails his year or withdraws or does not write one or more final examinations must make special application for readmission to the Faculty in order to repeat his year. All such applications will be dealt with on their own merits by the Admissions Committee.

(ii) *Examination results*

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

(iii) *Re-Reading of Examination Papers*

Re-readings are governed by the following regulations:

1. Any request for the re-reading of an answer paper must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be re-funded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers in the work of one academic year.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of examinations held in the first year.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Withdrawal

Any student who after registration decides to withdraw from the Faculty must report to the Registrar's office and to the office of the Dean. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Admission as Barristers and Solicitors

The possession of an LL.B. degree does not in itself confer the right to practise law in British Columbia. Admission to the Bar of the Province of British Columbia is governed by the Legal Professions Act and the regulations of the Law Society of British Columbia. Applicants for admission to the Law Society must comply with the requirements of the Society as to academic standing and ethical standards.

The examinations held in the Faculty of Law are co-examined by examiners appointed by the Law Society, and applicants for admission to the Bar who hold the degree of LL.B. from the University are granted exemption by the Law Society from the professional examinations prescribed by the regulations of the Society, which form part of the qualifications for admission to the Bar.

Applicants who intend to practise law in other jurisdictions should apply for information concerning the requirements for Call and Admission to the Secretary of the governing body of the legal profession in those jurisdictions. In British Columbia information should be obtained from the Secretary of the Law Society, The Court House, Vancouver, B.C.

The Law Review

In 1949 the students of the Faculty of Law commenced publication of "Legal Notes", which was an annual volume containing articles and comments written both by students and by outside contributors. By 1959 the publication had increased both in size and in the number of subscribers to the point where the editors felt that the name should be changed to the University of British Columbia Law Review. The students are responsible for the soliciting and editing of material, and for the advertising and sales which make the Review self-sufficient. Members of the Faculty give advice and assistance to the Editorial Board of the Review, but the chief responsibility is that of the Board.

COURSES OF INSTRUCTION

FIRST YEAR

All students must take the following courses:

101. **Constitutional Law. Two hours per week, both terms.**
General principles of English constitutional law; proceedings against the Crown in right of Canada and of British Columbia; distribution of legislative power in Canada.
Required: Laskin, *Canadian Constitutional Law*; the B.N.A. Act, 1867; the Constitution Act, R.S.B.C. 1960.
Recommended: Wade and Phillips, *Constitutional Law* (6th edition); O'Connor, *Report on the B.N.A. Act*.
Mr. Bourne, Mr. Lysyk.
103. **Contracts. Three hours per week, both terms.**
Historical development; formation and enforceability of contracts; parties; contractual terms; changes of circumstances; remedies for breach.
Required: Milner, *Cases on the Law of Contracts*.
Recommended: Cheshire and Fifoot, *Law of Contract*; Anson, *Law of Contract*; Williston, *Contracts* (Student edition); Corbin, *Contracts* (student edition).
Mr. Ison, Mr. Dunlop.
105. **Legal Institutions I. Two hours per week, both terms.**
An introduction to the history, structure and underlying concepts of the common law system of civil litigation; a critical evaluation of modern trial procedure as a means of conducting legal controversy.
Required: *Cases and Materials in Trial Procedure* (U.B.C.).
Recommended: Maitland, *The Forms of Action*.
Mr. Getz, Mr. Herbert.
107. **Legal Writing and Research. Two hours per week, both terms.**
A systematic instruction in the assessment and use of law reports, statutes, regulations and other secondary legal materials. Each student is required to prepare a number of written assignments during the course of the year. Each student is also required to argue a moot court case during the year, which will involve the preparation of pleadings, and written and oral argument before the moot court.
Materials to be assigned.
109. **Real Property. Three hours per week, both terms.**
Historical and conceptual analysis of interests in land, future interests, the Torrens system of land registry.
Required: *U.B.C. Cases and Materials on Real Property* (1960); Land Registry Act, R.S.B.C. 1960.
Recommended: Cheshire, *Modern Real Property*; Lawson, *Introduction to the Law of Property*, 1958.
Mr. Todd, Mr. Lyon.

111. Torts. Three hours per week, both terms.

A study of the bases of civil liability for intentionally and accidentally caused harms.

Required: Wright, *Cases on the Law of Torts*, 3rd edition.

Recommended: Fleming, *Law of Torts*; Pollock, *The Law of Torts*; Winfield, *Textbook on the Law of Tort*; Street, *The Law of Tort*; *Salmund on Torts*, 13th edition.

Mr. Smith, Mr. Mackenzie.

SECOND YEAR

All students are required to take the following courses:

203. Administrative Law. Two hours per week, both terms.

Consideration of the system of legal control exercised through administrative agencies and tribunals other than the courts.

Required: Huberman, *Cases and Materials on Administrative Law*.

Recommended: Allan, *Law and Orders*; Griffith and Street, *Principles of Administrative Law*; Robson, *Justice and Administrative Law*; S. A. de Smith, *Judicial Review of Administrative Action*; Davis, *Administrative Law*; Report of the Committee on Administrative Tribunals and Enquiries (1957).

Mr. Herbert, Mr. Huberman.

205. Business Organizations. Two hours per week, both terms.

The structure and characteristics of the sole proprietorship, the partnership and the corporation; the promotion and organization of business corporations; authority and fiduciary obligations of management; shareholders' rights and remedies.

Required: Gower, *Company Law* (2nd edition); Companies Act, R.S.B.C. 1960; Partnership Act, R.S.B.C. 1960.

Mr. Huberman, Mr. Getz.

207. Criminal Law and Procedure. Two hours per week, both terms.

Bases of criminal responsibility; principles and objectives of the criminal law and procedure; particular offences.

Required: Criminal Code and Selected Statutes; others to be announced.

Mr. Hooper, Mr. Atrons.

209. Equity and Trusts. Two hours per week, both terms.

The history and development of equity; certain equitable doctrines and remedies. The history and nature of trusts; express, resulting implied secret and charitable trusts, administration of the trusts, breach of trust.

Required: *U.B.C. Cases on Trusts* (1963).

Recommended: Keeton, *Introduction to Equity*; Nathan, *Equity Through the Cases*; Keeton, *Trusts*; Maitland, *Equity*; Snell, *Principles of Equity*.

Mr. Atrons, Mr. MacIntyre.

211. International Law. Two hours per week, both terms.

History, sources and evidence of international law and its relation to municipal law. International personality, state jurisdiction, treaties and international organizations.

Recommended: Oppenheim, *International Law*; Brierly, *The Law of Nations*; MacKenzie and Laing, *Canada and the Law of Nations*; Russbaum, *Concise History of the Law of Nations*; Sohn, *Cases and Materials on United Nations Law*.

Mr. Bourne, Mr. Jahnke.

219. Taxation. Two hours per week, both terms.

The law and practice of income tax as developed in the courts; succession duties and estate taxes.

Required: MacDonald, *Cases on Income Tax*, 2nd Ed.; The Income Tax Act; The Estate Tax Act; The Succession Duty Act, R.S.B.C.

Mr. English, Mr. MacIntyre.

Students must choose one of the following two courses:

201. Legal Accounting. Two hours per week, one term.

An introduction to basic accounting theory; statement analysis, valuation, and specific applications of accounting to legal problems.

Required: Materials to be announced.

Mr. Beedle.

or

217. Social Legislation. Two hours per week, one term.

A critical analysis of certain social legislation with reference to its history, its policy objectives, the legal concepts used, the types and suitability of the procedures for its administration, its treatment by the courts, tribunals and agencies, and its effectiveness in achieving the policy objectives sought. The particular area of study will be announced each year.

Required and recommended materials to be announced.

Mr. Ison.

Note: Students who have already received credit for an accounting course at the University level may not choose Law 201 (Accounting), but may choose between Law 217 (Social Legislation) and Law 313 (Insurance).

Students must choose one of the following two courses:

213. Jurisprudence. Two hours per week, both terms.

The nature and meaning of legal relations and related concepts; the principal schools of legal philosophy; certainty and change in the law; the evaluation of law; the relationship between law and morality, ethics, justice; law and policy.

Required: Hohfeld, "Fundamental Legal Concepts"; Jerome Frank, *Law and the Modern Mind*; mimeographed materials; other books to be announced.

Recommended: Morris, *The Great Legal Philosophers*; MacGuigan, *Jurisprudence: Readings and Cases*; Olafson, *Society, Law and Morality*;

Stone, *The Province and Function of Law*; Dias, *Jurisprudence*; Lloyd, *The Idea of Law*.

Mr. Smith, Mr. Dunlop.

or

215. Legal Institutions II. Two hours per week, both terms.

An examination of the functions of and the interrelationships among the various institutions that make up our legal system, with specific reference to private arrangements (contract, arbitration, etc.), the courts, and the legislature. The precise problems to be covered will vary from year to year, but may include such areas as control over communication media, supervision of corporate power, the development of Workmen's Compensation law, etc.

Materials to be announced.

MOOT COURT

Each student in the second year will be required to argue a moot case, including preparation of pleadings and oral argument. Staff members of the Law Review may, with the prior approval of the Faculty, submit a case comment or other piece of legal research, in substitution for the moot requirement. The moot or legal writing must meet the standard required by the Faculty in order for the student to receive credit for the year, and the performance will be entered on the student's record. Students exercising the option to write in the second year must moot in the third year.

THIRD YEAR

A. Full Year Courses

Each student must take Law 309 (Evidence) and at least three of the remaining four courses and may elect to take all of the Full Year Courses.

305. Conflict of Laws. Two hours per week, both terms.

A study of the legal problems arising in cases in which the relevant facts cut across provincial or national boundaries. Consideration is given to the rules concerning jurisdiction of the courts, choice of appropriate domestic law and recognition of foreign judgments in such fields as marriage, divorce, nullity, legitimacy, contracts, torts, property, administration of estates and succession.

Recommended: Cheshire, Private International Law; Dicey, The Conflict of Laws.

309. Evidence. Two hours per week, both terms.

Problems of proof, materiality, admissibility; the hearsay rule, confessions, opinion evidence, relevancy, corroboration, character evidence, witness, and similar problems will be studied.

Required: Morton, Cases on Evidence; Evidence Act, R.S.B.C. 1960; Canada Evidence Act, R.S.C. 1952.

Recommended: Cross, Evidence; Phipson, Evidence; Wigmore, Evidence.

311. Family Law. Two hours per week, both terms.

The law of marriage, separation and divorce. Custody, support and adoption of children; family courts, property rights.

Required: *U.B.C. Cases on Domestic Relations*; selected statutes.

Recommended: Power, *The Law of Divorce in Canada* (2nd ed.).

317. Mercantile Law. Two hours per week, both terms.

The Sale of Goods Act, problems of financing with conditional sales agreements and chattel mortgages. Export sales contracts. The law of negotiable instruments.

Required: Atiyah, *The Sale of Goods*; other materials to be announced.

323. Real Estate Transactions. Two hours per week, both terms.

A study of the law of mortgages, vendor and purchaser, and landlord and tenant; equal time being allotted to each of the above subjects.

Materials to be announced.

B. Half Year Courses

A student who has chosen four of the above Full Year Courses (including Law 309—Evidence) must take two of the following Fall Term Courses and two of the following Spring Term Courses. A student who has chosen all five of the above Full Year Courses must take one of the following Fall Term Courses and one of the following Spring Term Courses.

Fall Term Courses

313. Insurance. Two hours per week, fall term.

The general legal principles of life, automobile, fire, and other types of insurance. Materials to be announced.

315. Labour Law. Two hours per week, fall term.

Union-management relations; the collective bargaining process; the collective agreement, arbitration and conciliation procedure. The relationship between the union and its members.

Required: *U.B.C. Cases on Labour Law*; selected statutes.

319. Municipal Law.

The municipality as a legal entity; its creation, operation and powers. By-laws and their validity; municipal taxation, tortious and contractual liability, planning and zoning.

Required: The Municipal Act, R.S.B.C. 1960 as amended.

Recommended: Rogers, *The Law of Canadian Municipal Corporations*; Manning, *Assessment and Rating* (4th ed. 1962); Crawford, *Canadian Municipal Government* (1954); Law Society of Upper Canada, *Special Lectures in Municipal Law* (1956).

321. Natural Resources. Two hours per week, fall term.

An attempt to define the role of law and lawyers in the total process

of resource exploitation. This course focuses mainly on the mining and forest industries of British Columbia as typical models for study. Materials to be announced.

325. Succession. Two hours per week, fall term.

The law of wills, intestate succession, statutory interference with wills, principles of probate and administration of estates. Materials to be announced.

329. Trade Regulation. Two hours per week, fall term.

The regulation of competition; combinations in restraint of trade, mergers, monopolies, resale price maintenance, discriminatory pricing, and other pricing practices. Alternatives to competition: public utility regulation, government marketing boards, and public ownership. Materials to be announced.

Spring Term Courses

301. Maritime Law. Two hours per week, spring term.

The law relating to admiralty and marine jurisdiction, carriage of cargo and passengers, rights and duties of seamen and other maritime workers, general average, collision, limitation of liability, salvage, towage, maritime liens, charter parties, etc.

Recommended: Mayers, *Admiralty Law and Practice*; Roscoe, *Admiralty Law and Practice*; Canada Shipping Act; Water Carriage of Goods Act, Admiralty Act; Marsden, *The Law of Collisions at Sea*; Scrutton, *Charterparties and Bills of Lading* (16th ed. 1955); Carver, *Carriage of Goods by Sea*.

303. Business Organizations II. Two hours per week, spring term.

Advanced study of corporation planning; corporate reorganization and the problems of financing and taxation. Materials to be announced.

307. Creditors' Remedies. Two hours per week, spring term.

The remedies of the unsecured creditor, such as execution, garnishment, and equitable execution; fraudulent conveyances and preferences; creditors' agreements; mechanics' liens; bankruptcy.

Required: MacGuigan, *Cases and Materials on Creditors' Rights*; various statutes. Other materials to be announced.

327. Taxation II. Two hours per week, spring term.

An intensive study of some of the more difficult problems of corporate taxation; the effect of reorganizations and amalgamations; special estate tax and succession duty problems.

C. Seminars (Law 331)

Each student is required to take one seminar. The number and content of these seminars will vary from year to year, but the following are representative of those offered in previous years. A substantial paper is required in each seminar, and students are expected to devote at least as much time to a seminar as to any other course.

The Closed Corporation

The corporation, taxation, accounting, insurance and estate planning

aspects of the closed corporation, the formation of corporations, the compensation of executives, the sale or purchase of businesses with reference to the closely held corporation.

Mr. Huberman.

Current Problems in Constitutional Law

Selected constitutional problems of current interest; consideration of legal concepts and problems arising out of federal organization.

Mr. Lysyk.

International Law Problems

A research seminar in which selected problems of international law and government of current interest and importance will be investigated; examples are the financing of the United Nations, offshore fishing limits, the Cyprus situation, peaceful coexistence, etc.

Mr. Bourne.

Problems in Land Use Control: Community Planning and Zoning, Expropriation and Compensation

The philosophy of planning, zoning and expropriation; and some of the ground rules.

Mr. Todd.

International Law and Transactions

Principles of international law in the context of economic transactions. The first part will be concerned with public transactions, particularly public economic institutions and treaties with economic significance. The latter part will be devoted to an examination of the effects of these institutions, treaties and principles upon private international transactions.

Mr. Jahnke.

Government Regulation of Business

An examination of the structure and operation of a particular industry and the various forms of government regulation to which it may be subjected, such as conservation of national resources, combines, government marketing boards, public utility regulation, merchandising and advertising (including trade marks, unfair methods of competition, frauds on consumers, public health and trading stamps), customs, excise and quotas, governmental licensing and public ownership. The industry chosen will be announced each year.

Mr. Ison.

Special Problems in Labour Law

An examination of concrete examples of problems of contract formation; specific problems in collective agreement observance. Participants in the seminar will be provided with evidence and argument relating to the range of problems which arbitration boards are called upon to consider and will produce and defend solutions to them.

Mr. Herbert.

D. Moot Court or Legal Writing

Each student in the third year will be required to argue a moot case (including preparation of pleadings and oral argument) or with the prior approval of the Faculty, to submit a case comment or other piece of legal research. Although this requirement is not given a grade which is included in the year average, the performance of the student must be satisfactory to the Faculty and will be entered on the student's record. It is expected that those electing the writing option will make their work available to the Law Review, although it may not necessarily be selected. Students who have exercised the option to write in the second year must moot in the third year.

Graduate Studies

The degree offered is the Master of Laws (LL.M.).

Purpose: The programme provides graduates with the opportunity for advanced legal education in preparation for law teaching, legal research, public service and the practice of law.

Standard of Admission: A candidate for admission to the graduate programme must demonstrate that he is qualified to engage in creditable research in law by possessing an adequate academic foundation and a capacity for superior performance. He must have a Bachelor of Laws degree or its equivalent from an approved law school, and must have obtained First Class standing (deemed to be 75% in legal studies in the Faculty of Law) or its equivalent in at least two of the courses and at least Second Class standing or its equivalent in the remaining courses of the final year of work that is accepted by the Faculty of Law as prerequisite to the Master's programme.

A candidate's admission is not complete until his application has been accepted and his course of study has been approved by the Faculty of Law.

Requirements of the Programme: The graduate programme in law is administered by the Faculty of Law. The requirements for the LL.M. are:

- (a) Full-time residence at the University for a minimum of one academic year (September to May).
- (b) Lectures and seminars amounting to eight class hours per week, chosen in consultation with the Faculty of Law. These may be courses presently offered by the Faculty of Law or may be arranged specially for candidates for the LL.M. A candidate must obtain an overall average of 65% on the work of the year. He may have no more than one mark falling below 65% and no mark below 60%.
- (c) A thesis of satisfactory quality prepared under the direction of a member of the Faculty of Law on a subject related to the general programme of study of the candidate. Its preparation should occupy half of the candidate's time in the programme. It should normally be completed within the period of residence, but in exceptional circumstances permission may be granted for its completion after the period of residence.
- (d) An oral examination covering the course work, the written work, or both. This requirement may be waived by the Faculty of Law.

Areas of Study: The courses offered from year to year are listed and described in the annual Calendar of the Faculty of Law, which may be obtained from the Registrar.

The programme for each candidate will be designed to meet his special needs, interests, and previous experience. Special courses may be arranged to cover various areas of the law in which the Faculty has special library or other facilities. Various members of the Faculty are prepared to supervise students writing their thesis in the specific fields of law outlined in the courses of study for the three undergraduate years, problems arising out of these courses, and such additional fields of study as may be arranged with the Faculty.

A candidate may be allowed to select courses in other faculties of the University in substitution for those mentioned in (b) above, but it is expected that the major part of his programme will be undertaken in the Faculty of Law. Some possible courses for the graduate law student are listed below, grouped under headings which indicate the relevant field of legal study.

Administrative Law:

- Political Science 302 (Public Administration)
- Political Science 502 (Public Administration)
- Sociology 325 (Theory of Organizations)

Government Regulation of Business:

- Economics 311 (Market Structure and Public Policy)
- Economics 511 (Industrial Structure and Public Policy)
- Agricultural Economics 501 (Advanced Marketing)

Constitutional Law:

- History 420 (Evolution of the Canadian Constitution)
- Political Science 401 (Canadian Government and Politics)
- Political Science 407 (American Government and Politics)
- Political Science 501 (Seminar in Canadian Government & Politics)
- Political Science 506 (Models of the Political System)

Criminal Law:

- Social Work 629 (Contemporary Issues in Corrections)

International Law:

- Economics 502 (International Trade)
- Political Science 398 (International Organization since 1919)
- Political Science 409 (Comparative Foreign Policies)
- Political Science 410 (International Violence and Its Control)
- Political Science 509 (International Organization)

Jurisprudence:

- Philosophy 425 (Philosophy of Social Science)
- Philosophy 512 (Seminar on Political Philosophy)
- Philosophy 212 (Deductive Logic)
- Philosophy 320 (Empiricism)
- Philosophy 302 (Ethics)

Philosophy 402 (Symbolic Logic)
Philosophy 304 (Political Theory)
Political Science 500 (Political Theory)

Labour Law:

Commerce 322 (Labour Relations)
Economics 407 (Labour Economics)
Economics 507 (Labour Economics)

Municipal Law:

Political Science 404 (Municipal Government)

Land Use Control:

Commerce 307 (Urban Land Investment)
Commerce 309 (Urban Land Investment)
Commerce 407 (Land Value and Valuation)
Commerce 507 (Land Investment Problems)
Commerce 508 (Government Policy in Urban Land Ownership)

Natural Resources:

Economics 309 (Economics of Natural Resources)
Economics 509 (Economic Analysis and Natural Resources)
Forestry 363 (Forest Management I)
Forestry 463 (Forest Management II)
Geography 307 (Political Geography)
Applied Science 350

Taxation:

Economics 310 (Government Finance)
Economics 510 (Government Finance)
Commerce 552 (Income Determination)

Application: Candidates seeking admission to the graduate programme should obtain application forms and other information from the Registrar of the University. Completed forms must be received by the Registrar by March 1 preceding the academic year for which admission is sought.

**THE FACULTY
OF
MEDICINE**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Medicine calendar, 1966-67

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 FRANK E. McNAIR, B.A. (Brit. Col.), M.D., C.M. (McGill), Clinical In-
 structor.
 RAYMOND PARKINSON, B.A., M.D. (Brit. Col.), Clinical Instructor.
 ROY SLAKOV, B.Sc., M.D. (Oregon), Clinical Instructor.
 GORDON H. STEPHENSON, M.D. (Toronto), Clinical Instructor.
 YVONNE A. TOPF, Dipl. Assoc. Occupational Therapists (Oxon.), Clinical
 Instructor.
 JOHN WALSH, M.B., Ch.B., B.A.O. (N.U.I.), Clinical Instructor.
 RODERICK L. WHITMAN, B.Sc. (Sask.), M.D., C.M. (McGill), D.P.M. (Lon-
 don), Clinical Instructor.
 JOHN ROBERT WILSON, M.D., C.M. (Queen's), Clinical Instructor.
 BENNETT WONG, B.A. (Sask.), M.D. (Alta.), Clinical Instructor.
 ERNEST WONG, B.A. (Sask.), M.D. (Alta.), Clinical Instructor.
 C. HEGLER GUNDRY, M.D. (Toronto), Lecturer (Honorary).
 RICHARD GUY RICHMOND, M.R.C.S. (England), L.R.C.P. (London), Honorary
 Lecturer.

Section of Psychology

- HARRY KLONOFF, B.A. (Man.), M.A. (Toronto), Ph.D. (Wash.), Assistant
 Professor.
 EDWARD M. COLES, B.Sc., Ph.D. (London), Instructor.
 WALTER A. NORTON, B.A., Ph.D. (London), Instructor.
 VIMLA GUPTA, B.A. (Agra), M.A. (Patna), Ph.D. (Kansas), Clinical In-
 structor.

Section of Social Psychiatry

- ALEXANDER RICHMAN, M.D. (Man.), D.Psych. (McGill), M.P.H. (Johns
 Hopkins), Associate Professor.

Section of Child Psychiatry

- HAMISH NICHOL, M.A., M.B., B.Chir. (Cantab.), M.R.C.S. (Eng.), L.R.C.P.
 (London), Assistant Professor.
 ANDREW N. McTAGGART, B.A. (Brit. Col.), M.D., C.M., D.P.M. (McGill),
 Assistant Professor.
 KEITH B. AKINS, M.D., C.M. (Queen's), Clinical Instructor.
 ALAN CASHMORE, M.B., B.S., M.D. (London), Clinical Instructor.

Kinsmen Laboratory for Neurological Research

- WILLIAM C. GIBSON, B.A. (Brit. Col.), M.Sc. (McGill), D.Phil. (Oxon.),
 M.D., C.M. (McGill), F.A.C.P., Research Professor and Director Kinsmen
 Laboratory for Neurological Research.
 PATRICK L. McGEER, B.A. (Brit. Col.), Ph.D. (Princeton), M.D. (Brit. Col.),
 Associate Professor.
 JUHN WADA, M.D., D.M.Sc. (Hokkaido), Associate Professor.

- EDITH G. McGEER, B.A. (Swarthmore), Ph.D. (Virginia), Research Associate.
 SAKTY P. BAGCHI, Ph.D. (Calcutta), Research Associate.
 DAVID A. V. PETERS, B.Sc., Ph.D. (Dundee), Research Associate.
 CHRISTINE P. LAING, B.Sc., Ph.D. (Edinburgh), Research Associate.
 HISAO IKEDA, M.D., Ph.D. (Okayama), Fellow.
 ROBERT L. JONES, B.Sc., Ph.D. (London), Post-Doctoral Fellow.
 TETSUHIKO ASAKURA, M.D., Dr. Med. Sc. (Kagoshima), Post-Doctoral Fellow.

Department of Surgery

- F. R. C. JOHNSTONE, M.B. (Edinburgh), M.Sc. (Brit. Col.), F.R.C.S. (Edinburgh), F.A.C.S., Associate Professor, and Acting Head of the Department.
 WALLACE B. CHUNG, M.D., C.M. (McGill), F.R.C.S.(C), Assistant Professor.
 ALAN D. FORWARD, M.D. (Brit. Col.), F.R.C.S.(C), Instructor.
 I. B. HOLUBITSKY, M.Sc., M.D. (Alta.), F.R.C.S.(C), Instructor.
 ALLAN D. MCKENZIE, M.D. (Alta.), F.R.C.S.(C), F.A.C.S., Clinical Professor.
 THOMAS R. SARJEANT, B.A., M.D. (Toronto), F.R.C.S. (Eng.), F.R.C.S.(C), F.A.C.S., Clinical Professor.
 ROBERT H. GOURLAY, M.D., C.M. (McGill), F.R.C.S.(C), Clinical Associate Professor.
 WILLIAM H. SUTHERLAND, B.A. (Brit. Col.), M.D., C.M. (McGill), F.R.C.S.(C), Clinical Associate Professor.
 P. G. ASHMORE, M.D. (Toronto), F.R.C.S.(C), Clinical Assistant Professor.
 JOHN A. ELLIOTT, M.D. (Toronto), F.R.C.S. (Edinburgh), F.A.C.S., Clinical Assistant Professor.
 A. MAXWELL EVANS, M.D., C.M. (McGill), D.M.R.E. (Cantab.), Clinical Assistant Professor (Therapeutic Radiology).
 JOHN A. MACDOUGALL, M.D. (Man.), F.R.C.S. (England), F.R.C.S.(C), Clinical Assistant Professor.
 ROGER WILSON, M.D., C.M. (McGill), F.R.C.S.(C), F.R.C.S. (England), F.A.C.S., Clinical Assistant Professor.
 W. ERIC AUSTIN, M.D. (Man.), F.R.C.S. (Edinburgh), F.A.C.S., F.R.C.S.(C), Clinical Instructor.
 WILLIAM J. CHARLTON, M.D. (Man.), F.R.C.S.(C), Clinical Instructor.
 R. M. CHRISTENSEN, B.A., M.D. (Brit. Col.), F.R.C.S.(C), Clinical Instructor.
 GLEN M. CRAWFORD, M.D. (West. Ont.), Clinical Instructor (Therapeutic Radiology).
 LUCILLE ELLISON, M.D. (Man.), Clinical Instructor (Therapeutic Radiology).
 J. R. FARISH, B.A. (Brit. Col.), M.D., C.M. (McGill), F.R.C.S.(C), Clinical Instructor.
 LEONARD B. FRATKIN, B.Sc., M.D. (Alta.), F.R.C.S.(C), Clinical Instructor.
 JOHN W. FROST, B.A. (Brit. Col.), M.D., C.M. (McGill), F.R.C.S. (Edinburgh), F.R.C.S.(C), Clinical Instructor.
 JOHN A. GANSHORN, M.D. (Man.), M.S. (Minn.), Clinical Instructor.
 J. M. W. GIBSON, B.Sc., M.B., Ch.B. (Glasgow), Clinical Instructor (Therapeutic Radiology).
 G B. GOODMAN, M.B., Ch.B. (Edinburgh), D.M.R.T. (London), Clinical Instructor (Therapeutic Radiology).

- PAUL P. JACKSON, B.S. (E. Central State Coll.), M.D. (Oklahoma), F.A.C.S.,
Clinical Instructor.
- B. T. H. MARTEINSSON, B.Sc., M.D. (Man.), F.R.C.S. (England), Clinical In-
structor.
- W. ARTHUR MORTON, M.B., Ch.B., F.R.C.S. (Edinburgh), Clinical Instructor.
- J. E. MUSGROVE, M.D. (Man.), F.R.C.S.(C), Clinical Instructor.
- ROBERT E. McKECHNIE, M.D., C.M. (McGill), M.S. (Minn.), F.A.C.S.,
Clinical Instructor.
- THOMAS R. OSLER, M.D., C.M. (McGill), F.R.C.S.(C), Clinical Instructor.
- J. D. RANDALL, M.B., B.S. (London), F.R.C.S. (England), Clinical Instructor.
- PETER REES-DAVIES, M.R.C.S. (England), L.R.C.P. (London), F.R.C.S. (Eng-
land), F.R.C.S.(C), F.I.C.S., F.A.C.S., Clinical Instructor.
- RICHARD E. ROBINS, M.D. (West. Ont.), F.R.C.S.(C), Clinical Instructor.
- J. T. M. SANDY, M.D. (West. Ont.), F.R.C.S.(C), Clinical Instructor.
- JOSEPH G. SLADEN, M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.
- FRANK B. THOMSON, B.A., M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.
- D. B. WALCOTT, B.Sc., M.D., C.M. (McGill), F.R.C.S.(C), Clinical In-
structor.
- J. W. WILSON, M.D., C.M. (McGill), F.R.C.S.(C), Clinical Instructor.

Division of Anaesthesiology

- HORACE B. GRAVES, B.A., M.D., C.M. (McGill), F.R.C.P.(C), Clinical
Associate Professor.
- JONE CHANG, M.D. (Toronto), F.R.C.P.(C), Clinical Assistant Professor.
- W. A. DODDS, M.D. (Toronto), Clinical Assistant Professor.
- L. C. JENKINS, B.S., M.D., C.M. (McGill), F.R.C.P.(C), Clinical Assistant
Professor.
- JOHN JAMES CARROLL, B.A. (Bishop's), M.D., C.M. (McGill), Clinical In-
structor.
- LOIS DAVIES, M.D. (Toronto), Clinical Instructor.
- W. L. ESDALE, B.Sc., M.D. (Alta.), Clinical Instructor.
- J. B. FULTON, B.A., M.D. (Alta.), Clinical Instructor.
- EDWIN ROBERT HALL, B.Sc., M.D. (Alta.), Clinical Instructor.
- WILLIAM M. HALL, M.D. (Alta.), Clinical Instructor.
- P. W. HUDSON, M.D. (Alta.), Clinical Instructor.
- JEAN T. HUGILL, B.Sc., M.D. (Alta.), Clinical Instructor.
- HAROLD ANDERSON KESTER, B.A., M.D. (West. Ont.), Clinical Instructor.
- DONALD MATHESON, M.B., Ch.B. (Aberdeen), F.F.A.R.C.S.(England), Clinical
Instructor.
- F. W. McCAFFREY, B.A. (Montreal), M.D. (Laval), Clinical Instructor.
- J. E. NIXON, M.D. (West. Ont.), Clinical Instructor.
- JOHN L. OULTON, B.Sc., M.D., C.M. (McGill), Clinical Instructor.
- I. S. PATERSON, M.B., B.S. (London), F.F.A.R.C.S.(England), Clinical In-
structor.

PETER B. PERCHESON, M.D., C.M. (Queen's), F.R.C.P.(C), Clinical Instructor.

JOHN CRANSTON POOLE, M.D. (Man.), Clinical Instructor.

HERBERT SAMUEL RANDALL, B.A. (New Bruns.), M.D., C.M. (McGill), Clinical Instructor.

COLIN A. SANDS, B.A. (Sask.), M.D. (Toronto), Clinical Instructor.

M. H. SCHULTZ, M.D., C.M. (Queen's), Clinical Instructor.

GUY SCREECH, M.A., M.B.B.Chir. (Cantab.), M.R.C.S., L.R.C.P., D.A. (London), Clinical Instructor.

R. E. SIMPSON, B.A., M.A. (Brit. Col.), M.D., C.M. (Queen's), Clinical Instructor.

G. E. SLEATH, B.A. (Brit. Col.), M.D. (Alta.), Clinical Instructor.

G W. SLEATH, B.A., M.D. (Brit. Col.), F.R.C.S.(C), Clinical Instructor.

RALPH STAPLES WOODSWORTH, M.D. (Man.), Clinical Instructor.

Division of Neurosurgery

GORDON B. THOMPSON, B.Sc. (Man.), M.D., C.M. (McGill), F.R.C.S.(C), Clinical Assistant Professor.

FRANK A. TURNBULL, B.A. (Brit. Col.), M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.

JOSEPH W. CLUFF, B.Sc. (Sask.), M.D. (Man.), F.R.C.S.(C), Clinical Instructor.

PETER O. LEHMANN, M.D. (Man.), Clinical Instructor.

P. D. MOYES, M.B., B.S. (London), M.S. (Minn.), F.R.C.S.(C), Clinical Instructor.

Division of Orthopaedics

FRANK P. PATTERSON, M.D., C.M. (McGill), F.R.C.S.(C), F.A.C.S., Associate Professor (Part-time).

CAMERON S. ALLEN, M.D., Ch.M. (Man.), M.S. (Minn.), F.R.C.S.(C), F.A.C.S., Clinical Assistant Professor.

ERIC C. H. LEHMANN, M.D. (Toronto), F.R.C.S.(C), Clinical Assistant Professor.

K. S. MORTON, B.A., M.Sc. (Brit. Col.), M.D., C.M. (McGill), F.R.C.S.(C), Clinical Assistant Professor.

ARTHUR S. McCONKEY, M.D. (Alta.), Clinical Assistant Professor.

F. C. PRESTON, M.D., B.Sc. (Toronto), F.R.C.S.(C), Clinical Assistant Professor.

WILLIAM J. THOMPSON, B.Sc. (Sask.), M.D. (Man.), F.R.C.S.(C), Clinical Assistant Professor.

C. E. COOK, M.D. (Alta.), F.R.C.S.(C), Clinical Instructor.

W. HARRY FAHRNI, M.D. (Man.), M.Ch.Orth. (Liverpool), F.R.C.S. (Edinburgh), F.R.C.S.(C), Clinical Instructor.

HECTOR S. GILLESPIE, M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.

A. M. INGLIS, M.D. (Man.), F.R.C.S.(C), Clinical Instructor.

R. G. MACLACHLAN, M.D. (West. Ont.), F.R.C.S.(C), Clinical Instructor.

D. MCPHERSON, M.D. (West. Ont.), M.Sc. (Brit. Col.), F.R.C.S.(C), Clinical Instructor.

- J. W. SPARKES, M.D. (Toronto), Clinical Instructor.
 J. G. WATT, M.D. (Brit. Col.), F.R.C.S.(C), Clinical Instructor.
 H. S. MILLER, B.A. (Brit. Col.), M.D., C.M. (McGill), F.R.C.S.(C), Teaching Fellow.
 HUGH C. MACNIEL, M.D. (Toronto), F.R.C.S.(C), Teaching Fellow.

Division of Otolaryngology

- GORDON H. FRANCIS, B.A., M.D. (West. Ont.), Clinical Associate Professor.
 BENJAMIN W. TANTON, M.D., C.M. (McGill), Clinical Assistant Professor.
 GARNET A. BADGER, M.D. (Alta.), Clinical Instructor.
 M. P. BANNO, M.D. (Brit. Col.), Clinical Instructor.
 NATHANIEL J. BLAIR, M.Sc., M.D. (Man.), Clinical Instructor.
 KENNETH G. CAMBON, B.A., M.D., C.M. (McGill), Clinical Instructor.
 GLEN P. KONG, B.A. (Wash.), M.D. (Brit. Col.), Clinical Instructor.
 PATRICK J. DOYLE, M.D. (Alta.), Clinical Instructor.
 HENRY B. LOCKHART, B.Sc. (New Bruns.), M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.
 WILLIAM J. PATTERSON, M.D. (Ottawa), Clinical Instructor.
 ALFRED O. STEBNICK, B.Sc. (Man.), M.D. (Laval), Clinical Instructor.

Division of Plastic Surgery

- R. J. COWAN, M.D. (Toronto), F.R.C.S.(C), Clinical Assistant Professor.
 ALBERT D. COURTEMANCHE, M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.

Division of Thoracic Surgery

- GEORGE D. SAXTON, M.D. (Man.), F.R.C.S. (Edinburgh), Clinical Assistant Professor.
 PETER ALLEN, M.D. (Toronto), F.R.C.S.(C), Clinical Instructor.
 W. G. TRAPP, M.D., C.M. (McGill), F.R.C.S.(C), F.A.C.C.P., Clinical Instructor.

Division of Urology

- JOHN A. BALFOUR, M.D. (Alta.), F.R.C.S.(C), Clinical Associate Professor.
 LESLIE R. WILLIAMS, M.D., C.M. (McGill), F.R.C.S. (Edinburgh), F.R.C.S. (C), Clinical Assistant Professor.
 G. J. ANKENMAN, M.D., C.M. (Queen's), F.R.C.S.(C), Clinical Instructor.
 JOHN W. ARBUCKLE, JR. M.D., C.M. (McGill), F.R.C.S.(C), Clinical Instructor.
 HAROLD LEO CHAMBERS, B.A. (Sask.), M.D. (Toronto), Clinical Instructor.
 HARRY G. COOPER, B.A., M.D. (Alta.), Clinical Instructor.
 DONALD A. MACDONALD, M.D., C.M. (McGill), F.R.C.S.(C), Clinical Instructor.
 HOWARD A. SMITH, B.A. (Cantab.), M.B., B.Ch. (Belfast), F.R.C.S. (Edinburgh), F.R.C.S.(C), Clinical Instructor.
 LORNE G. WOOD, M.D. (Alta.), F.R.C.S.(C), Clinical Instructor.
 H. W. JOHNSON, M.D. (Man.), F.R.C.S.(C), Teaching Fellow.

General Information

The medical course extends through four academic sessions and leads to the degree of Doctor of Medicine (M.D.).

The first two years of the course, devoted to the fundamental or pre-clinical medical sciences, are mainly given on the campus of the University. However, during the Second Year, instruction is transferred in part to the Vancouver General Hospital, Shaughnessy Hospital and St. Paul's Hospital.

The Third and Fourth Years of the course, the clinical years, are designed, not only to bring the student into contact with patients and to give him a knowledge of the natural history of disease, but also to provide him with the essentials of modern diagnosis and treatment. During the clinical years, in addition to the hospitals previously mentioned, the facilities of the Children's Hospital, Grace Hospital, the Provincial Mental Hospital, B.C. Cancer Institute, G. F. Strong Rehabilitation Centre are also utilized for clinical teaching.

Three new buildings were completed in 1961 to provide the Faculty of Medicine with well equipped teaching and research laboratories. These provide facilities for the Departments of Anatomy, Biochemistry, Pharmacology and Physiology and research space for the Department of Pathology, the Department of Psychiatry (Kinsmen Laboratory for Neurological Research), and the Cancer Research Centre (National Cancer Institute of Canada).

The Woodward Biomedical Library, opened in November 1964, houses, on campus, library facilities including medical reference sections and study areas. A branch library is maintained at the Vancouver General Hospital.

To add to the University facilities for medical research, the G.F. Strong Laboratory for Medical Research was established in January 1959. This laboratory provides facilities for medical research conducted by members of the staff of the Faculty of Medicine and other qualified persons, subject to the approval of the committee of the Laboratory and the Director. The Kinsmen Laboratory for Neurological Research was established September 1, 1960, and a floor of special laboratory facilities in the new Medical Sciences Buildings has been provided. A large Cancer Research Centre, a unit of the National Cancer Institute of Canada, also built in association with these buildings, came into full operation in September, 1961.

The School of Rehabilitation Medicine, established in 1961, is a part of the Faculty of Medicine and offers training in physical and occupational therapy. However it issues its own calendar and enquiries should be sent to the Director of the School.

The newly formed Faculty of Dentistry took a small entering class in the fall of 1964. This class is accommodated in existing facilities. Construction has begun and a full class of students will be admitted in the fall of 1967. Enquiries should be directed to the Dean, Faculty of Dentistry.

Planning is now well advanced for the construction of a 410-bed hospital on campus. It is expected that the hospital will be completed by the end of 1969.

Admission to the Faculty of Medicine

Admission to the Faculty of Medicine is based primarily on ability and premedical achievement as demonstrated by scholastic records and aptitude tests, and on qualities as evidenced by interviews and letters of recommendation.

It is required that candidates shall have completed (as a minimum) three full years in the Faculty of Arts and/or in the Faculty of Science at the

University of British Columbia or its equivalent. The minimum acceptable scholastic average is Second Class standing (a minimum of 65%).

Classes entering the First Year of Medicine are limited to a maximum of sixty (60) students.

A candidate is required to take the Medical College Admission Test by the fall of his third year of premedical training. Arrangements to take the test should be made with the premedical advisor of the institution at which the student is taking his premedical work. Information regarding this test may be obtained from the Psychological Corporation, 304 East 45th Street, New York 17, or from the Personnel Office of this University. At the time the test is taken, the student should request that the scores be sent to the Screening Committee, Faculty of Medicine, the University of British Columbia, Vancouver 8, B.C. Failure to take the test by the time indicated above will result in relatively late consideration of the applicant's credentials by the Screening Committee.

No applicant will be accepted if he has been required to withdraw from another medical school for academic reasons.

Application blanks will be available in the Faculty of Medicine office from August 15 to December 15. Completed applications should be received by that office as early as possible, and in any case not later than December 31. It is the responsibility of the applicant to see that all official transcripts of university or college credits, including Grade 13 marks, are received in the Faculty of Medicine office not later than the date mentioned.

An applicant with physical handicaps requiring periodic medical attention or interfering with normal activities must submit a medical certificate with his application. In this certificate, the examining physician should describe the extent of the disability and estimate its effect upon the applicant's future ability to practice medicine.

A personal interview with the Screening Committee may be required of any applicant.

A small number of applicants may be issued tentative acceptances prior to Christmas. These are the outstanding applicants. A larger group of acceptances will be issued after transcripts of results of Christmas examinations at the University of British Columbia and the University of Victoria have been received and processed. This is usually by the end of January. The remaining places in the entering First Year class are filled after transcripts of results of spring examinations at the University of British Columbia and University of Victoria have been received. This is usually completed by June 1.

All tentative acceptances are subject to confirmation only upon satisfactory completion of current courses.

An applicant who is accepted must pay a preliminary fee of \$100.00 to be applied to the tuition of the First Year of the medical course. This fee must be paid within two weeks of notification of acceptance and will not be refunded if the student subsequently enters another medical school, or if, without adequate reason, he fails to register in the Faculty of Medicine at the University of British Columbia.

A successful applicant who is taking his premedical work at the University of British Columbia is required to pass a physical examination at the University Health Service preceding admission. A successful applicant from another institution must submit, prior to registration, a medical certificate from his own physician, on the form provided by the University Health Service. Immunization against smallpox is required.

Premedical Requirements

The requirements listed below apply to the student taking his premedical work in the Faculty of Arts and/or in the Faculty of Science at the University of British Columbia. An applicant from another university must submit evidence of having successfully completed equivalent prerequisite courses.

English: English 100 (Literature and Composition).

Mathematics: Mathematics 110 or 120 (Algebra, Geometry, Trigonometry and Calculus).

Chemistry: Chemistry 101 or 102 (General Chemistry), or 110 (Principles of Chemistry), Chemistry 200 (Analytical Inorganic and Physical) or Chemistry 205 (Inorganic and Analytical Chemistry), Chemistry 203 or 230 (Organic Chemistry).

Physics: Physics 101 (Elementary Physics), or Physics 103 (A Survey of Physics), or Physics 110 (Mechanics, Electricity and Atomic Structure).

Biology: Biology 101 (Principles of Biology) or equivalent.

The student should select other courses to conform with the requirements for a baccalaureate degree. In general, medical school courses should not be anticipated.

The prospective applicant should realize that these are the **minimal** requirements for entrance to the Faculty of Medicine. In the selection of his courses during his premedical preparation, the student should always keep in mind that he may wish to take further courses or complete degree requirements prior to his entrance to the Faculty of Medicine. It is urged that he seek advice from the appropriate department before he selects a course.

Admission of Students by Transfer

1. A student who has successfully completed one or two years of the medical course at an accredited medical school may apply for transfer to this Faculty of Medicine as a Second or Third Year student as applicable. No student will be accepted by transfer after the beginning of the Third Year.

2. The acceptance of transfer students will depend upon the existence of vacancies.

3. An applicant for transfer must present credentials covering the pre-medical and medical courses completed at the institution of his first registration.

Registration

The academic year of the Faculty of Medicine begins on the first Tuesday after Labour Day.

Registration of medical students will take place in the Faculty of Medicine office, and students in each year of the medical course will be notified of the time for their registration. On the opening day of the new session, students must personally obtain registration cards at the Faculty of Medicine office.

No student will be allowed to register after the first day of instruction in the term, nor will he be admitted to any class after its first meeting, except by permission of the Dean.

Fees—*Subject to change without notice*

Tuition and incidental fees in each year of the medical course are \$673. (First Term \$351, including the A.M.S. fee, and the Second Term \$322.) Additional fees include the Graduating Class Fee of \$7.00, payable by all

students in their Final Year, and the Hospital Fee of \$5.00 where applicable.

Students in the Faculty of Medicine must conform to the general regulations of the University with respect to payment of fees at the office of the Accountant on the day of registration.

Student Expense

The following instruments and supplies will be required during the course; it is recommended that no purchases be made until details are furnished at the beginning of the courses by the departments concerned.

First Year:	Approximate Price
Microscope—an approved student model	\$150.00-\$200.00
Instruments for anatomy and physiology	\$10.00
Stethoscope	\$5.00-\$8.00
Laboratory coats (4)	\$20.00

The microscope should be of substantial construction and provided with the following accessories: objectives—16 mm., 4 mm. and 1.8 mm. oil immersion; oculars 5X and 10X; triple nose-piece; and substage condenser with an iris diaphragm. In Second Year the student is advised to obtain a "scanning objective" (x 2.5 or 3.5) which can be substituted for one of the standard objectives of the microscope. This is needed in the Pathology course. (The cost will vary from \$3.50 to \$7.50.)

Second Year

Ophthalmoscope with otolaryngological attachments	\$40.00-\$60.00
Sphygmomanometer	\$35.00-\$40.00

Third Year

Haemoglobinometer	\$12.50-\$15.00
Haemocytometer	\$15.00

Information regarding textbooks will be given at the first class period in each course. Not less than \$100.00 per year should be available for purchasing textbooks and expendable supplies.

Financial Aid

For descriptions of bursaries, fellowships, scholarships and loans see later section of this calendar and the separate publication *Awards and Financial Assistance*.

Time Tables

Time tables will be announced at the time of registration.

Courses Leading to the M.D. Degree

The subjects in which instruction is given in the four academic sessions leading to the M.D. degree are as follows:

First Year:

Anatomy (including Embryology and Histology), Biochemistry, Physiology, Preclinical Sessions, Medical Statistics, History of Medicine & Science.

Second Year:

Genetics, Introduction to Medicine, Microbiology, Neuroanatomy, Neurophysiology, Introduction to Obstetrics, Pathology, Introduction to Paediatrics,

Parasitology, Introduction to Psychiatry, Pharmacology and Toxicology, Introduction to Surgery, Permissible Electives.

Third Year:

Medicine and Therapeutics, Obstetrics and Gynaecology, Ophthalmology, Paediatrics, Surgical Pathology, Psychiatry, Preventive Medicine I, Radiology, Surgery (including specialties), Clinical Microscopy.

Fourth Year:

Medicine and Therapeutics (including specialties), Medical Jurisprudence, Obstetrics and Gynaecology, Ophthalmology, Paediatrics, Preventive Medicine II, Psychiatry, Physical Medicine, Radiology, and Surgery (including specialties).

The First, Second, and Third Years of the medical course are divided into two terms; the Fourth Year is divided into three terms.

Examinations and Advancement

Attendance

1. Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments, may, on the recommendation of the Head of the Department, be excluded by the Dean of the Faculty from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

2. Students, who because of illness are absent from a term or final examination, must submit a certificate, obtained from a physician, to the University Health Service as promptly as possible.

3. Unavoidable absence of one day or less for reasons other than sickness must be explained to the instructor or instructors concerned when the student returns to classes. If the absence is for longer than one day, he must arrange for readmission through the Dean's office.

4. A student *planning* to be absent from classes for *any reason* must obtain previous permission from the Dean's office.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's Office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees.

Examinations

1. Examinations in the Faculty of Medicine may be held at various times throughout the year. These examinations are obligatory for all students.

2. Should a student find that he will be unavoidably absent from a sessional examination, he or someone familiar with his situation must notify the Dean's office of the facts in the case before the end of the period during which the examination is scheduled. Failure to observe this rule may result in a failure being recorded in the course.

3. When a sessional examination has been missed through illness or some other justifiable cause, application for *deferred examination* or special consideration must be made in writing to the Dean not later than 48 hours after the close of the examination period. If the absence was for reasons of

health, a physician's certificate indicating the nature and duration of the illness must be submitted to the University Health Service.

4. A student may be denied the privilege of writing a sessional examination in any subject because of unsatisfactory work or attendance, and in this case he will be considered to have failed in the course.

5. In any course which involves both laboratory work and written examinations, a student is required to make satisfactory standing in both parts. If the course is repeated, no exemption will ordinarily be granted from the work in either part.

6. Term essays and examination papers may be refused a passing mark if they are illegible or noticeably deficient in English.

7. The passing mark in the Faculty of Medicine is 60%. Examinations will be graded as follows: First Class, an average of at least 80%; Second Class, 65%; Pass, 60%.

8. All results of final examinations will be passed upon by the Promotions Committee and approved by Senate. Release of results will be made by the Registrar. Final examination results will not be communicated through any other channel.

Advancement

1. The Faculty will determine the student's fitness for promotion at the end of each session. No student with defective standing will be promoted.

2. A student whose academic standing is unsatisfactory may be required either to withdraw from the Faculty or to repeat the entire work of the year.

3. If the progress of a student has been unsatisfactory in any given session, the Faculty may permit a supplemental examination in the subject failed provided: (i) his attendance has been satisfactory; (ii) he has not failed in more than two subjects; and (iii) he has an average of at least 60% in the work of the year including the failed subjects. The department or departments concerned may direct such work as will be necessary to prepare for the supplemental examination. It is the responsibility of the student to consult the heads of the departments concerned about such arrangements. If the student satisfies the requirements of the departments concerned and passes each supplemental examination with a mark of at least 65% he will be promoted.

4. A student in the First Year who fails to be promoted will not be permitted to repeat the year except under special circumstances.

5. A student will not be permitted to repeat more than one year except under special circumstances.

6. A student who repeats a year is required to attain a mark of at least 65% in the examination in each subject.

7. Although satisfactory academic performance is prerequisite to advancement it is not the sole criterion in the consideration of the suitability of a student for promotion or graduation. The Faculty reserves the right to require a student to withdraw from the Faculty if he is considered to be unsuited to proceed with the study or practice of medicine.

Subjects of the Final Examinations

First Year:

Anatomy (including radiological), Histology (including embryology), Biochemistry, Physiology.

Second Year:

Anatomy (neuroanatomy), Introduction to Clinical Medicine, Microbiology, Pathology, Pharmacology, Parasitology, Physiology (Neurophysiology).

Third Year:

Medicine, Clinical Microscopy, Obstetrics and Gynaecology, Paediatrics, Psychiatry, Preventive Medicine, and Surgery.

Note: Questions on Radiology may be asked on the papers in Medicine, Surgery, Paediatrics or Obstetrics.

Fourth Year:

Conjoint Examinations

The majority of the Canadian medical colleges now utilize the Medical Council of Canada Examinations as final examinations in the Fourth Year, and the University of British Columbia conforms to this practice.

The Medical Council prescribes papers in Medicine and Therapeutics, Obstetrics and Gynaecology, Public Health and Preventive Medicine, Paediatrics and Surgery. The Faculty of Medicine will grade these papers for University purposes. In addition, the Faculty of Medicine will administer University examinations in the subject of Psychiatry.

All written and oral examinations will be held in late April or in May, depending upon the schedule of the Medical Council of Canada.

The fee which is charged by the Medical Council of Canada is one hundred forty dollars (\$140.00) payable to the Registrar of the Medical Council.

The successful completion of these examinations is prerequisite to the granting of the M.D. degree.

Enabling Certificates

1. An Enabling Certificate is required for admission to the examinations of the Medical Council of Canada. This certificate is obtained from a provincial College of Physicians and Surgeons.

2. If a student plans to practice in British Columbia, he should make application to the Registrar, College of Physicians and Surgeons of British Columbia, to receive the required Enabling Certificate. Application should be made *not later than February 1* in the Final Year of the medical course. Forms will be made available in the Dean's office.

3. A student planning to practice medicine outside this Province should comply with the regulations of the appropriate licensing body, including the requirements of other Colleges of Physicians and Surgeons.

4. A student who has registered in another Province should ordinarily obtain his Enabling Certificate from the Province of his student registration.

Requirements for the Degree of M.D.

1. A candidate for the M.D. degree must be at least twenty-one years of age. He must have fulfilled all the requirements for entrance to the Faculty of Medicine and have attended the four full years of instruction which comprise the medical course. No one will be admitted to candidacy for the M.D. degree who has not been in attendance for the final two years in the Faculty of Medicine at the University of British Columbia.

2. Each candidate for graduation must have passed all the required examinations in the subjects comprising the medical course, and have received acceptable ratings in Preclinical Sessions, Permissible Electives, Thesis, and in certain other courses where satisfactory completion is required but specific marks are not assigned.

3. The Faculty will recommend to Senate the granting of the M.D. degree to a student who has completed satisfactorily the academic requirements and who, in addition, is considered by the Faculty to be a suitable person to practice Medicine.

4. Each candidate for the M.D. degree must make formal application, on a form obtainable at the Registrar's Office, for graduation at least one month prior to the Congregation at which he expects to obtain the degree.

Regulations Regarding Licence to Practice Medicine

The possession of an M.D. degree does not, in itself, confer the right to practice medicine in any province in Canada. Each province has a College of Physicians and Surgeons, as mentioned previously, and these Colleges have the final authority to grant a licence to practice medicine within their jurisdictions. The possession of the Certificate of the Medical Council of Canada (L.M.C.C.) is one of the major requirements of the Provincial Colleges of Physicians and Surgeons for registration.

In British Columbia, the College of Physicians and Surgeons requires that in addition to holding the certificate of the Medical Council of Canada an applicant must have served a one-year rotating internship in an approved hospital before being eligible for a licence to practice.

Internship

The serving of an internship is not prerequisite to graduation from the Faculty of Medicine in this university. In all but exceptional cases, however, it is in the best interests of the medical graduate to interne for at least one year. This is true even if he plans a career which does not involve the care of patients. Basic medical education is not considered complete without the serving of an internship.

The Faculty of Medicine assists in the arranging for internships and advises on the merits of those available. The office of the Dean should be consulted early in the Fourth Year before students apply to the hospitals in which they are interested.

It should be clearly understood that the Faculty of Medicine does not undertake interne placement or the assignment of graduating students to internships. The Canadian Association of Medical Students and Internes, however, operates a placement service.

Courses of Instruction

Medical students are offered courses numbered 400 to 424 in the First Year of the medical course, 425 to 449 in the Second Year, 450 to 474 in the Third Year, and 475 to 499 in the Fourth Year.

Courses offered to non-medical students, numbered below 500, are intended primarily for students at pre-baccalaureate levels in the University. Courses numbered 500 or higher are normally for postgraduate students in the Faculty of Medicine and candidates for advanced degrees in the Faculty of Graduate Studies. Registration in these courses is at the discretion of the department concerned.

Courses numbered 900 and above are non-credit courses and do not count toward a degree.

Department of Anatomy

390. (3) **Basic Human Anatomy.**—A lecture course dealing with the basic structure of cells, tissues and organs of the human body in relation to their function. Prerequisites: Chemistry 101 or 102 or 110 and Biology 101 or

equivalent; exemptions may be arranged for Honours or Graduate students. Permission of the Department is required. [3-0; 3-0]

400, 401. **Human Anatomy.**—A correlated course of study for medical and dental students of the structure of the human body including gross, microscopic and radiological anatomy and embryology. Clinics are held in cooperation with the Departments of Medicine and Surgery. Both terms. Textbooks: (1) Gardner, Gray, O'Rahilly, *Anatomy*, Gray's *Anatomy*, Cunningham's *Textbook of Anatomy*, or Grant, *Method of Anatomy*; (2) Grant, *Atlas of Anatomy*, or Jamieson, *Illustrations of Regional Anatomy*; (3) Friedman, *Visual Anatomy*; (4) Zuckerman, *A New System of Anatomy*; (5) Ham, *Textbook of Histology*.

425. **Elements of Neuroanatomy.**—An introduction to the structure of the human nervous system. First term. Textbooks: Ransom, Clark, *Anatomy of the Nervous System* or Strong, Elwyn, *Human Neuroanatomy*. Given only in conjunction with Physiology 425.

Graduate Courses

500. (6) **Gross Human Anatomy.**—An advanced laboratory course in the structure of the human body.

501. (3) **Microscopic Human Anatomy.**—An advanced laboratory course in the microscopic structure of the human body.

502. (4) **Microscopic Anatomy.**—The microscopic anatomy of tissues and organs in man. Prerequisite: Anatomy 401 or equivalent.

504. (1) **Seminars in Ultrastructure.**

510. (2) **Neuroanatomy.**—The gross and microscopic study of the nervous system in man.

511. (3) **Neuroanatomy.**—Selected advanced topics.

548. (1-3) **Directed Studies in Anatomy.**

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

903. **Surgical Anatomy.**—A review course in human anatomy as applied to surgery.

Department of Biochemistry

400. **General Biochemistry.**—A laboratory, lecture and conference course dealing with the chemical and physical chemical phenomena underlying the functioning of the normal human body. For Medical and Dental students. Honours students may be admitted to the course after consultation with the Department.

410. (3) **Outlines of Biochemistry.**—A lecture course dealing with the structure, function and metabolic reactions of proteins, carbohydrates, nucleic acids, lipids and steroids; enzymology and bioenergetics; biochemical transfer of genetic information and protein synthesis; regulatory mechanisms; control of cellular activity. Prerequisite: Chemistry 203 or 230. [3-0; 3-0]

411. (1) **Biochemistry Laboratory.**—A laboratory course designed to illustrate the general principles of Biochemistry. Biochemistry 410 must precede or accompany this course. [0-3; 0-3]

430. (1) **Perspectives in Biochemistry.**—A seminar course on the history of biochemistry. Prerequisites: Biochemistry 400 or 410.

449. (3) **Thesis.**—A laboratory research problem under the direction of a staff member.

Graduate Courses

Biochemistry 410, or the equivalent, is prerequisite to all graduate courses in Biochemistry. Students are advised not to take graduate courses in Biochemistry unless they have obtained at least 65% in Biochemistry 410 or the equivalent.

500. (1) **Biochemical Methods.**—A study of the principles of modern advanced biochemical techniques and their application to the solution of biochemical problems.

502. (1) **The Biochemical Function of Proteins.**—Modern concepts of the relationship between macromolecular structure and biochemical function. Given 1966-67 and alternate years.

503. (1) **Biochemistry of the Nucleic Acids.**—The chemical, physical and biological properties of nucleotides and nucleic acids, the elucidation of nucleic acid structures and modern concepts of their function and replication in the cell. Given 1966-67 and alternate years.

504. (1) **Biochemistry of Amino Acids and Proteins.**—Metabolism of individual amino acids and modern concepts of the biosynthetic mechanisms leading to the formation of proteins by cellular components. Given 1966-67 and alternate years.

505. (1) **Biochemistry of Carbohydrates.**—The metabolism and function of polysaccharides and the metabolic reactions associated with monosaccharides. Given in 1967-68 and alternate years.

506. (1) **Biochemistry of Lipids.**—Modern concepts of the metabolism and biochemical function of fats, phospholipids and cholesterol. Given in 1967-68 and alternate years.

507. (1) **Biochemistry of Steroids and Hormones.**—Modern concepts of the metabolism and biochemical function of the sterols, bile acids, steroid hormones, catecholamines and peptide hormones. Given in 1967-68 and alternate years.

530. (1) **Seminar in Biochemistry.**—Attendance is required of all graduate students in Biochemistry. Normally each will present one paper per year on a topic approved by his research advisor or committee or on the results of his research.

548. (1-3) **Directed Studies.**—In special cases, with approval of the Head of the Department, advanced courses may be arranged for graduate students in attendance.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Department of Continuing Medical Education

The Department of Continuing Medical Education has been established to assist hospitals in interne-residency education, to encourage and increase medical enrolment in the Faculty of Graduate Studies, and to assist in the provision of qualifying courses for the Fellowship and Certification of the Royal College of Physicians and Surgeons of Canada. The Department serves to integrate and expand the programme of continuing education for practising physicians. Assistance is available to coordinate medical post-graduate education programmes with those of allied professional and technical groups in the health care field.

Department of the History of Medicine and Science

400. **History of Medicine.**—Introduction to the history of discovery in the medical and allied sciences, with emphasis on the discoverers and the social background of their times.

501. (1) **History of Medicine.**

Department of Medicine

425. Clinical Diagnosis.—The methods and application of techniques of clinical history-taking and physical examination, covered by lecture demonstrations and bedside clinics. Correlation of disordered function and anatomical changes as well as analysis of symptoms and signs. Close integration with the Department of Surgery is maintained in the presentation of this subject. Textbooks: required—Leopold, *Principles and Methods of Physical Diagnosis*; recommended—Chamberlain, *Symptoms and Signs in Clinical Medicine*; Major, *Physical Diagnosis*; MacBryde, *Signs and Symptoms*.

450. Principles of Medicine and Clerkship in Medicine.—1. Systematic lectures and clinics covering the broad range of the medical disorders of the following groups—cardiovascular, dermatological, endocrinological and metabolic, gastro-intestinal, haematological, infections, neurological, renal, respiratory including pulmonary tuberculosis, and rheumatic. Application of the basic medical sciences to clinical medicine is stressed. 2. Individual work and instruction of small groups on the medical wards. Students record case histories, perform physical examinations and carry out laboratory studies. Textbooks: Harrison, *Principles of Internal Medicine*; Beeson, McDermott, Cecil-Loeb, *Textbook of Medicine*; Brainerd, Margen, Chatton, *Current Diagnosis and Treatment*. Both Terms.

451. Introduction to Therapeutics.—A course of didactic lectures and class exercises to introduce systematic therapeutics and the use of drugs for specific disease processes. Practice in prescription writing is included in the course. (Subject to examination at the end of the Third and Fourth Years.) Both terms.

452. Clinical Microscopy.—A course of lectures and laboratory periods in which methods used in haematological diagnosis are studied, with emphasis particularly on their clinical application and significance. First term.

465. Principles of Radiological Diagnosis.—A course of lectures to acquaint the student with the use of X-ray in diagnosis. The basic physics of roentgenology is dealt with. (Questions may be included on papers in Medicine, Obstetrics, Paediatrics, or Surgery.) Both terms.

475. Medicine.—Outpatient service: the student is assigned new patients for study and takes part in the general medical clinic and specialty clinics including neurology and dermatology. Inpatient service: the student takes part in the activities of the service by having assigned patients, attending ward rounds and clinics. Social Service aspects of medicine are discussed with the students. Division of Tuberculosis Control: the student is assigned to the Willow Chest Centre for practical experience in respect to pulmonary tuberculosis. Members of the Department of Medicine take part in discussions concerning various topics in conjunction with other departments at the weekly comprehensive seminars presented for final year students. Textbooks: as for Medicine 450.

476. Therapeutics.—Further presentation of lectures and class exercises covering systematic therapeutics and the proper employment of drugs. Case presentations are used to demonstrate specific treatment problems. (Questions will be included on paper in Medicine.)

490. Principles of Therapeutic Radiology.—Lectures and conferences covering the physical principles employed in therapeutic radiology. First term.

Department of Microbiology
(Faculty of Science)

425. Medical Microbiology.—Morphologic and cultural characteristics of bacteria, viruses and fungi pathogenic for man. Offensive properties of microorganisms and defensive mechanisms of the body. Disinfection and sterilization. Chemotherapeutic agents. Discussion of epidemiologic features, sources of infection, modes of transmission, prevention, specific treatment and laboratory diagnostic procedures of human infectious diseases.

[First term; first 8 weeks: 7-5; last eight weeks: 6-3]

Department of Obstetrics and Gynaecology

425. Introduction to Obstetrics.—A course of lectures encompassing anatomy and physiology of the reproductive tract, fertilization, implantation and development of the embryo and placenta, maternal and foetal physiology. Recommended textbooks for all obstetrics courses in Second, Third and Fourth Years: Eastman, *Obstetrics*; Reid, *Textbook of Obstetrics*; Douglas and Stromme, *Operative Obstetrics*.

451. Principles of Obstetrics.—A series of lectures in the first half of the year covering the field of normal and abnormal obstetrics. During two of the four quarters, small group seminars as well as out-patient and ward instruction at the patient's bedside are conducted.

451. Principles of Gynaecology.—A series of lectures and demonstrations which deal with the more common gynaecological diseases. Teaching and demonstrations to small groups of students supplement the didactic work. Recommended textbooks: Kimbrough, *Gynaecology*; Behrman and Gosling, *Fundamentals of Gynaecology*. Second term.

475. Obstetrics.—Each student lives in the maternity pavilion for a period of five weeks during which he takes histories and examines patients in the Outpatient Department, arranges for their admission to the wards and continues to observe them through delivery up to their discharge from hospital. Ward rounds and teaching clinics are scheduled.

476. Gynaecology. — During the living-in-hospital period, the student attends Gynaecology Outpatient Department clinics, is assigned patients on the ward for study, and is required to assist at operations.

Department of Ophthalmology

Third Year: Instruction will be given by lectures, outpatient and bedside clinics. Classes will be divided into sections. In each section the applied anatomy and physiology of the eye and orbit will be studied. The emphasis in the lectures and clinics will be on ophthalmoscopy and will be largely devoted to the relation of ophthalmoscopic lesions and general medicine. Each student should have his own ophthalmoscope. A written examination will be held at the end of each sequence of instruction.

Fourth Year: The student is assigned to the Department of Ophthalmology for a period of one week. Intensive instruction in the diagnosis and treatment of the commoner diseases of the eye will be given including the ophthalmic indications of systemic disease. The student attends ward rounds and is given clinical instruction by the staff clinicians. He will be assigned to the specialty eye clinics which include eye pathology, neuro-ophthalmology, glaucoma, corneal, ocular radiotherapy and retina clinics. An oral and written examination will be given at the end of each sequence of instruction.

Department of Paediatrics

425. Introduction to Paediatrics.—A clinical course for Second Year medical students. Each group of 5 or 6 students spends a total of 8 mornings, during which the emphasis is on growth and development, interviewing and physical examination. Children of various ages and their parents are seen by students at the Child Health Programme and on one morning at a school. The following topics are introduced: nutrition, immunization, accident prevention, parent counselling, anticipatory guidance, the role of the public health nurse and social worker, and school health. At the Health Centre for Children the growth and development of the child with a handicap and the child in hospital is discussed on three mornings. The short lecture series is designed to complement the above course. Reference books: *Pediatrics*, Waldo E. Nelson; *Manual of Pediatric Physical Diagnosis*, Lewis A. Barness.

430. (3) Human Genetics.—A course of lectures, seminars and directed studies related to the investigation of genetic variations in man. Prerequisites: Biology 330 or equivalent. [3-0; 3-0]

450. Principles of Paediatrics and Clerkship in Paediatrics.—1. This is a systematic series of lectures and clinics devoted to the essential principles of paediatrics. No attempt is made to cover the entire field of paediatrics, but emphasis is placed on the normal and abnormal newborn physiology, infant and child feeding, metabolic derangements, acute infectious diseases, cardiac abnormalities, blood diseases, respiratory problems, etc. Students are as far as possible taught in small groups. 2. As clinical clerks, students are assigned to the Department of Paediatrics for three afternoons a week for an eight-week period. This time is devoted primarily to methods of history-taking and physical examination of infants and children. The students are encouraged to follow up their cases in so far as the three afternoons a week allow this. They also visit schools for the mentally retarded, the G. F. Strong Rehabilitation Centre and other child health agencies.

475. Paediatrics.—Students are assigned to the Department of Paediatrics for five weeks. They spend half their time in the paediatric outpatient department and half in the inpatient department. In the evenings, two students are assigned to the paediatric wards to help with the care of the acute cases admitted. Students are responsible for history-taking and the general investigation of cases assigned to them and take part in the ward rounds with members of the Attending and Full-Time Staff. In the outpatient department, special emphasis is placed on the more common types of disease seen and students are introduced to comprehensive care for the handicapped child of all types including the deaf, the mentally retarded and the behaviour problem. Seminars and discussions are held each day, more emphasis being placed on therapy in this course than in the previous ones. An attempt is made to make the student a fundamental part of the medical team.

530. (3) Advanced Human Genetics.

549. (3-6) Master's Thesis.

Department of Pathology

425. Human Pathology.—This course covers the basic principles of general pathology and their application on a systemic basis as an introduction to the study of clinical medicine. Emphasis is placed on the etiology, pathogenesis and natural history of disease. Disordered physiology and applied clinical chemistry are correlated with the pathologic lesions that comprise organic disease. The course consists of lectures and correlated laboratory

periods which include gross and histopathology, autopsy demonstrations, clinical biochemistry, clinical pathological conferences, and student seminars. Both terms.

450. **Surgical Pathology.**—A series of pathology demonstrations in conjunction with various clinical departments designed to illustrate the role of pathology in the diagnosis and management of various diseases.

475. **Medical Jurisprudence.**—A general survey of medico-legal problems likely to be encountered by physicians. The role of forensic medicine and toxicology in the administration of justice is emphasized.

Department of Pharmacology

425. **Medical Pharmacology.**—A lecture and laboratory course covering the fundamental pharmacological actions of drugs. Both terms.

Graduate Courses

500. (2) **Advanced Pharmacology.**—Lectures, conferences, and supervised reading in the pharmacological literature. Prerequisite: Pharmacology 425 or its equivalent.

511. (2) **Pharmacology Seminar.**

512. (4) **Advanced Pharmacological Techniques.**—Lectures, conferences, assigned readings and laboratory exercises in methods and instrumentation available for studying various types of drug actions. Prerequisite: Pharmacology 425 or its equivalent.

513. (2) **Pharmacology of Anaesthesia.**—Advances in the pharmacological aspects of anaesthesiology. Conferences, assigned reading and laboratory exercises demonstrating the actions of drugs as currently applied in the practices of anaesthesiology. Prerequisite: Pharmacology 425 or its equivalent.

514. (5) **Neuropharmacology.**—Chemical mediation of central synapses and the action of drugs on the central nervous system will be emphasized. Conferences, assigned reading, and laboratory exercises. Prerequisite: Pharmacology 425 or its equivalent.

549. (6) **M.A. Thesis.**

649. **Ph.D. Thesis.**

Department of Physiology

The department offers opportunities for study leading to doctoral, master's and bachelor's degrees. For information on the Ph.D. and M.Sc. degree courses, see the Faculty of Graduate Studies calendar. Information on the B.Sc. degree may be found in the calendar of the Faculty of Science.

Chemistry 101 or 102 or 110, Physics 110 or 101 and Biology 101 or the equivalents are prerequisite to all courses in Physiology.

310. (3) **General Physiology.**—Fundamental properties of living matter which may be described by physicochemical laws. It is strongly recommended that Chemistry 305 be taken concurrently. Prerequisite: Mathematics 202. Textbooks: Davson, *Textbook of General Physiology*; Giese, *Cellular Physiology*. [2-3; 2-3]

400. **Human Physiology.**—A lecture and laboratory course on body function with particular reference to human physiology. The functions of muscle, nerve, central nervous system, special senses, metabolism, circulation, respiration, excretion, digestion, and the endocrines are dealt with. Correlation clinics are held in cooperation with the Department of Medicine. Textbooks: Davson and Eggleton, *Starling's Human Physiology*; Ruch and Petton, *Physiology and Biophysics*. Both terms. [3-6; 3-6]

410. (3) **Advanced Mammalian Physiology.**—A lecture course on body function with particular reference to mammalian and human physiology. [3-0; 3-0]

411. (3) **Advanced Mammalian Physiology Laboratory.** — A laboratory course designed to illustrate physiological principles and to impart some training in physiological techniques. Normally taken in conjunction with Physiology 410. Enrolment is limited and subject to the consent of the Department. [1-6; 1-6]

425. **Elements of Neurophysiology.**—An introduction to the functions of the nervous system: First Term. Given only in conjunction with Anatomy 425. [2-3; 0-0]

440. (1) **Seminar.**—Open to Honours students in physiology and graduate students. [1-0; 1-0]

448. (1-3) **Directed Studies in Physiology.**

449. (3) **Graduating Essay.**—Prior to graduation, students in the Honours course will be required to carry out an investigation approved by the Head of the Department and to submit a satisfactory graduating essay based on this work.

Graduate Courses

Physiology 410, Biochemistry 410, or the equivalent, or consent of the Department, are prerequisite to all graduate courses.

510. (3) **Neurophysiology.**—For Students in Graduate Studies and Science. First term: Identical to Physiology 425. Second term: detailed study of synaptic transmission processes. Anatomy 510 must be taken concurrently.

511. (1-3) **Seminar in Mammalian Physiology.**—Seminar in selected topics in mammalian physiology.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Department of Preventive Medicine

400. **Introduction to Medical Statistics.**—A survey course by lecture and demonstration of the fundamentals, functions and limitations of statistical methods as applied to the health sciences.

426. **Parasites of Man.**—A lecture and laboratory course which deals with the life histories of the parasites of man and of insect vectors of human infections. The application to clinical practice is stressed. (Second term.)

450. **Preventive Medicine I.**—The prevention of and rehabilitation after communicable diseases, accidents, chronic diseases, and diseases peculiar to aging individuals. Both terms.

475. **Preventive Medicine II.**—Occupational health, principles of comprehensive health care, medical ethics and economics, role of the practicing physician in community and environmental medicine. Both terms.

Department of Psychiatry

425. **Introduction to Psychiatry.**—Lectures and supervised clinical experience. (a) Psychopathology and signs and symptoms in psychiatry; (b) psychiatric examination of the patient, including taking of the personal and family history and the mental status examination; (c) interview procedures and processes and interviewing under supervision; (d) history of psychiatry. Textbooks: Henderson and Gillespie, *Textbook of Psychiatry*; Mayer-Gross, Slater and Roth, *Clinical Psychiatry*; Ulett and Goodrich, *A Synopsis of*

Contemporary Psychiatry; Gregory, *Psychiatry—Biological and Social*. In addition, reading lists are provided for courses and areas of study.

450. Principles of Psychiatry and Clerkship in Psychiatry.—Based upon material covered in the First Year and Second Year, the student is expected to learn various aspects of the diagnostic process in psychiatry through lectures and supervised clinical experience. (a) Systematic review of psychiatric syndromes and reaction-types; (b) introduction to concepts of etiology including psychodynamics; (c) introduction to certain aspects of treatment. Textbooks: Besides textbooks already listed under Psychiatry 425, students should have *Diagnostic and Statistical Manual Mental Disorders*, prepared by the Committee on Nomenclature and Statistics of the American Psychiatric Association.

475. Psychiatry.—Emphasis is upon bringing together material learned in previous years on psychopathology, etiology and psychodynamics, and therapy in the development of a diagnostic formulation and a treatment plan. Under supervision, students carry out diagnostic interviews on patients in the Outpatient Department, arranging for treatment or referral. Lectures are concerned with further material on etiology and therapy, and with special topics in psychiatry—addiction, forensic psychiatry, child psychiatry, community psychiatry, ageing, mental deficiency, etc. Textbooks: see list given under Psychiatry 425 and reading lists provided.

Graduate Courses

500. (1) The History of Psychiatry.—A series of lectures and seminars given on alternate years in the second half of the year and concerned with an historical review of psychiatry from earliest times to the present.

501. (1) Psychopathology.—A series of lectures and seminars concerned with a presentation for graduate students of signs, symptoms and syndromes in psychiatry. Texts and readings are assigned.

502. (1) The Interview and the Examination of the Patient.—Lectures and demonstrations concerned with the concepts, processes and clinical skills required in interviewing both for diagnosis and for treatment. Texts and readings are assigned.

503. (2) Psychotherapy I.—Lectures, demonstrations and tutorials with an introduction to processes and techniques of individual psychotherapy. Texts and readings are assigned. Psychiatry 501 and 502 are prerequisites.

504. (1) Drugs and Somatic Treatments in Psychiatry.—Lectures and demonstrations concerned with a presentation of the rationale and use of drugs and somatic treatments. Texts and readings are assigned. Psychiatry 501 and 502 are prerequisites.

505. (1) Methods in Evaluation and Research.—A course of seminars and demonstrations dealing with methods and techniques for the evaluation of programmes and treatment in Psychiatry, with research design and research procedures, including such problems as the use of controls in psychiatric research, the use and interpretation of statistics, etc. Texts and readings to be assigned. The course is given in alternate years.

506. (1) The Province and Functions of Psychiatry.—A course of lectures and seminars dealing with roles, responsibilities and functions assumed by and assigned to psychiatry in medicine and in the community. The course deals with the patterns by which care has been made available in the past, with contemporary patterns now emerging, with the assumptions underlying these developments, and with the problems and issues that appear to be of relevance to psychiatry in the future. Given in alternate years.

507. (2) **Psychotherapy II.**—An advanced course concerned with the processes, techniques and theories of individual psychotherapy. Prerequisite: Psychotherapy I. Texts and readings are assigned. The course includes three hours of individual tutorial per week.

508. (1) **Group Therapy and Milieu Therapy.**—This course of lectures and demonstrations given in the third year deals with the theoretical and practical issues met with in the use of various social groupings—the therapeutic small group, the family, the ward and the community—in psychiatric treatment. Psychiatry 503 and 507 are prerequisites.

509. (1) **Theories and Etiology.**—This course deals with the “dynamics” of human behaviour and the etiology of mental illness in a comprehensive manner at three levels of organization—molecular and cellular, psychological and social.

510. (2) **The Neurological Basis of Human Behaviour.**—Concerned with the structure, development and function of the human nervous system and the relationship of these to normal and abnormal human behaviour, thinking and emotions. Given through the second year. Psychiatry 501 and 504 are prerequisites. Texts and readings are assigned.

511. (1) **The Neurological Basis of Human Behaviour (Laboratory).**—Dissections and demonstrations of the structure and functions of the human nervous system. Prerequisite: Psychiatry 510.

512. (1) **Problems of Cerebral Function.**—A dissertation in a field related to the content of Psychiatry 510. Prerequisite: Psychiatry 510.

513. (1) **Behaviour Physiology.**—An advanced course of lectures and seminars provided on an elective basis in the second half of the year and concerned with a survey of experimental work on the process of the nervous system underlying normal and abnormal behaviour in humans and primates; with special emphasis on the physiological correlates of higher nervous activity. Prerequisite: Psychiatry 501. Texts and readings to be assigned.

514. (1) **Neurochemistry.**—An advanced course provided on an elective basis elaborating chemical principles underlying mental functions. Current findings and theories on chemical aspects of mental illness and certain neurological disorders are presented and discussed. Prerequisite: Psychiatry 501.

515. (1) **Psychopharmacology.**—An advanced elective course presenting current facts and theories relating the use of various drugs, experimental and therapeutic, to basic chemical and enzymatic processes in brain and nervous tissue, with special reference to mental illness and research in psychiatry. Prerequisite: Psychiatry 501. Texts and readings to be assigned.

520. (2) **Social Psychiatry.**—A course of lectures and seminars dealing with the relationships between mental illness and a range of social and ecological variables, and with current epidemiological knowledge about the frequency and distribution of mental illness. Texts and readings are assigned.

530. (2) **Development and Learning.**—This course deals with individual development as related to personality growth, mental health, and mental illness. This is a required course for the second year. Texts and readings are assigned.

531. (1) **Child Psychiatry.**—This course deals with diagnosis, prevention and treatment of mental illness and mental retardation in children. Psychiatry 530 is a prerequisite.

540. (1) **Psychological Measurement.**—This deals with the rationale and administration of various psychological tests and measurements in the clinical setting, and with personality and other theories underlying their

use. The course has been developed for both psychiatrists and clinical psychologists in training. Given in the first year. Readings and texts are assigned.

550. (3) Directed Studies.—This provides for a programme of directed reading and study in such special area or areas as may be relevant to the student engaged in some particular area of study and research in Psychiatry.

560. (6) Master's Thesis.

Department of Surgery

425. Introduction to Surgery.—A series of lectures designed to illustrate the basic surgical principles. Bedside and outpatient clinics illustrating the principles of physical diagnosis are given in cooperation with the Department of Medicine and surgical specialties. Students are given the opportunity to examine patients. A series of lectures and demonstrations in first aid technique is given. Textbooks: Hamilton Bailey, *Physical Signs in Clinical Surgery*; Dunphy and Botsford, *Physical Examination of the Surgical Patient*. American Orthopaedic Association: *Manual of Orthopaedic Surgery*. Second term.

450. Principles of Surgery and Clerkship in Surgery.—Systematic lectures and clinics in general surgery, orthopaedic surgery, otorhinolaryngology, urology, neurosurgery, plastic surgery, chest surgery, and anaesthesiology, which emphasize the relationships of the basic sciences to an understanding of surgical conditions. The students are expected to acquire some knowledge of the whole field of surgery during their Third Year. Surgical diagnosis is emphasized rather than surgical techniques.

On the surgical wards of the Vancouver General Hospital, Shaughnessy Hospital and St. Paul's Hospital and at the B.C. Cancer Institute, individual work and instruction of small groups of students is carried on.

As clinical clerks, the students record case histories, perform physical examinations and carry out assigned laboratory studies on the general surgical and orthopaedic wards. Both terms.

Textbooks: Cole and Elman, *Textbook of General Surgery*; Christopher *Textbook of Surgery*; Moseley, *Textbook of Surgery*; Allen, Harkins and Rhoads, *Surgery Principles and Practice*; Bailey and Love, *Short Practice of Surgery*; J. Crawford Adams, *Outline of Fractures*; Boies, *Fundamentals of Otolaryngology*.

475. Surgery.—In fourth year each student receives surgical instruction in the Department of Surgery for a ten-week period during which he rotates through the services of general surgery, orthopaedic surgery, otorhinolaryngology, neurosurgery, urology and anaesthesiology. The student enters into the routine work of these services, attends the Outpatient and Emergency Departments, and is assigned to operating rooms, etc. The members of the Department of Surgery take part in discussions of various topics in conjunction with other departments at the weekly comprehensive seminars presented to final year students.

903. Surgery Review.—A thirty lecture-demonstration course in general surgery alternating with a similar series in specialty surgery. For post-graduate students proceeding to Certification or Fellowship of the Royal College of Physicians and Surgeons of Canada. One evening per week throughout the winter session.

904. Seminar in Orthopaedics.—A series of 60 seminars in orthopaedics and traumatic surgery given over a two-year period—thirty sessions in each of the two years. One evening per week throughout the winter session. For

postgraduate students proceeding to Certification or Fellowship of the Royal College of Physicians and Surgeons of Canada.

Interdepartmental Requirements

400. Preclinical Sessions.—Each student is assigned to a family in which there are young children, in order to permit observation of the growth and development of the children and the interpersonal relations of a growing family. The student visits the family at regular intervals and a half-day a week is set aside for discussion of problems which may arise. The tutors who guide the discussion with small groups of students are experienced clinicians.

425. Electives.—During the Second Term of the Second Year, each student will be given the opportunity to participate in an elective subject which will occupy one half day each week. Students will be supplied with a list of elective subjects available. Satisfactory completion of an elective will be required for promotion to Third Year.

426. Introduction to Clinical Medicine.—At the end of the Second Term in Second Year there will be a comprehensive written examination set by the clinical departments. In addition, each department may at its discretion, conduct such further oral and clinical examinations as it may desire. Satisfactory performance in this series of examinations is a pre-requisite to promotion to the Third Year.

475. Thesis.—Each candidate for the degree of Doctor of Medicine is required to present a thesis, acceptable to the Faculty, before January 1 of his Final Year. The work may be carried out under the sponsorship of any of the departments in the Faculty of Medicine: the subject and sponsor are to be chosen in consultation with a department head in the Faculty of Medicine, and the Dean's office must be notified of the title and sponsor, by the student, not later than November 1 of the Third Year.

The thesis must embody the results of original investigation or of a planned course of study in a field of learning related to medicine.

**THE SCHOOL
OF
REHABILITATION
MEDICINE**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**



The School of Rehabilitation Medicine calendar, 1966-67

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For topics not listed above, see the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

ACADEMIC STAFF

- BROCK M. FAHRNI, M.D. (Man.), F.R.C.P.(C), F.A.C.P., Director of the School and Associate Professor of Medicine.
- MISS MARGARET R. HOOD, Dipl. Occupational Therapy (Toronto), Instructor.
- MISS W. JANE HUDSON, Dipl. Physiotherapy, Dipl. Teaching Physical Therapy (Toronto), Instructor.
- H. S. HOWARD, Physiotherapy, Dipl. Teaching Physical Therapy (Chartered Society of Physiotherapy, England), Instructor.
- MISS MARGARET J. G. HUNTER, Dipl. Teaching Physical Therapy (Chartered Society of Physiotherapy, England), Instructor.
- MISS B. LOUISE MCGREGOR, Dipl. Physiotherapy (McGill), Dipl. Teaching Physiotherapy (Toronto), Instructor.
- MISS BEVERLEY McCONNELL, Dipl. Physiotherapy and Occupational Therapy (Toronto), Instructor.
- MRS. DELLA A. NORDICK, B.Sc. (P. & O.T.), M.Sc. (Anatomy) (McGill), Instructor.
- MRS. D. STYRA, Dipl. Occupational Therapy (Toronto), Instructor.

Lecturers from other Departments:

- P. Allen, Clinical Instructor, Surgery.
- E. J. Bradley, Instructor, Preventive Medicine.
- P. J. A. Bratty, Clinical Instructor, Medicine.
- W. T. Brown, Instructor, Psychiatry.
- W. H. Chase, Associate Professor, Pathology.
- R. M. Christensen, Clinical Instructor, Surgery.
- W. B. Chung, Assistant Professor, Surgery.
- J. W. Cluff, Clinical Instructor, Neurosurgery.
- P. Constantinides, Professor, Anatomy.
- A. D. Courtemanche, Clinical Instructor, Plastic Surgery.
- K. R. Donnelly, Assistant Professor, Anatomy.
- W. H. Fahrni, Clinical Instructor, Orthopedics.
- G. H. Francis, Clinical Associate Professor, Otolaryngology.
- V. O. Hertzmann, Clinical Instructor, Medicine.
- R. H. Hill, Instructor, Paediatrics.
- I. B. Holubitsky, Instructor, Surgery.
- A. M. Johnson, Clinical Instructor, Medicine.
- A. M. Marcus, Assistant Professor, Psychiatry.
- A. Marriage, Associate Professor, Sociology.
- H. S. Miller, Teaching Fellow, Orthopedics.
- J. C. Mitchell, Clinical Instructor, Medicine.
- K. S. Morton, Orthopedics, Clinical Assistant Professor.
- P. D. Moyes, Clinical Instructor, Neurosurgery.
- Miss E. K. McCann, Associate Professor, Nursing.
- Miss F. A. McCubbin, Associate Professor, Social Work.
- A. N. McTaggart, Assistant Professor, Child Psychiatry.
- H. Nichol, Assistant Professor, Child Psychiatry.
- R. L. Newman, Instructor, Psychiatry.
- A. C. Pinkerton, Clinical Instructor, Medicine.

G. E. Pirie, Instructor, Paediatrics.
 R. L. Ramsey, Assistant Professor, Physical Education.
 D. J. Randall, Assistant Professor, Zoology.
 A. Richman, Assistant Professor, Social Psychiatry.
 H. S. Robinson, Clinical Instructor, Medicine.
 G. D. Saxton, Clinical Assistant Professor, Thoracic Surgery.
 W. W. Simpson, Clinical Assistant Professor, Medicine.
 H. E. Taylor, Professor and Head, Pathology.
 G. B. Thompson, Clinical Assistant Professor, Neurosurgery.
 M. E. Towell, Assistant Professor, Obstetrics.
 J. S. Tyhurst, Professor and Head, Psychiatry.
 P. S. Vassar, Associate Professor, Pathology.
 Miss D. Washington, Assistant Professor, Education.
 W. A. Webber, Assistant Professor, Anatomy.
 H. D. Whittle, Professor, Physical Education.
 J. R. Wilson, Clinical Instructor, Psychiatry.
 W. A. Young, Clinical Instructor, Medicine.

Lecturers from other Institutions:

L. G. Andrews, G. F. Strong Rehabilitation Centre.
 W. S. Buckler, Vancouver General Hospital.
 M. W. Chepesuik, Shaughnessy Hospital.
 D. E. MacKay, St. Paul's Hospital.

List of Clinical Supervisors of School of Rehabilitation Medicine Students.

<i>Name</i>	<i>Hospital</i>
Miss R. Daggett, M.C.P.A.	Canadian Arthritis and Rheumatism Society.
Miss P. McBain, O.T.Reg.	Canadian Arthritis and Rheumatism Society.
Miss Wendy I. Dalzell, O.T.Reg.	Gorge Road Hospital, Victoria.
Mrs. Hilary Brown, M.C.P.A.	Holy Family Hospital.
Mrs. B. Hunter, O.T.Reg.	Holy Family Hospital.
Mrs. Murray, M.C.P.A.	Veterans Hospital, Victoria.
Mrs. M. Wiesman, M.C.P.A.	Lions Gate Hospital.
Miss J. Gihon, O.T.Reg.	Riverview Hospital.
Miss J. Archer, O.T.Reg.	Burnaby Mental Health Centre.
Mrs. Sue Smith, O.T.Reg.	Valleyview Hospital.
Miss Page, O.T.Reg.	Woodlands School.
Miss B. Halverson, O.T.Reg.	Woodlands School.
Miss E. Watkins, M.C.P.A.	Royal Columbian Hospital.
Mrs. B. McNeil, M.C.P.A.	St. Pauls Hospital.
Mrs. J. James, M.C.P.A.	Shaughnessy Hospital.
Mrs. R. Bailey, M.C.P.A.	G. F. Strong Rehabilitation Centre.
Miss M. Fairey, O.T.Reg.	G. F. Strong Rehabilitation Centre.
Miss B. Jones, M.C.P.A.	G. F. Strong Rehabilitation Centre,
Mrs. S. Leduc, M.C.P.A.	C.P. Centre.
Miss M. Izard, O.T.Reg.	Vancouver General Hospital.
Mrs. R. Fortune, M.C.P.A.	Vancouver General Hospital.
Mrs. A. LePage, O.T.Reg.	Vancouver General Hospital, Department of Psychiatry.

THE SCHOOL OF REHABILITATION MEDICINE

Combined Course in Physical and Occupational Therapy

The rehabilitative aspects of medical and surgical treatment assume greater importance as the profession becomes more interested in the problems of long-term illness. Increased awareness of the value of the therapist's work leads to increased use of her services by physicians at all levels of care, acute as well as chronic. As the practising physician is asked to take more responsibility for these community services, it becomes apparent that he will require competent assistants in order to discharge this responsibility adequately. The present course is medically oriented to produce a well-qualified therapist who, along with the nurse and physician, can fill an increasingly important role as the third member of the medical treatment team at hospital, rehabilitation centre, out-patient and home levels. It is anticipated that fresh interest in this field will place all branches of therapy in a more prominent position and create many more opportunities for those wishing to avail themselves of this training.

General Information

The course offered at the School of Rehabilitation Medicine consists of combined training in physical and occupational therapy. The purpose of this course is to provide basic knowledge and technical skills required to practise these therapies.

The first two years are given mainly on campus. During the summer sessions and in third year increasing amounts of clinical experience and instruction will be obtained in the occupational and physiotherapy departments under the guidance of University-appointed instructors.

On completion of the clinical experience following third year, a student will have obtained sufficient credits to meet the academic and practical requirements of the professional organizations for practice in these fields.

The fourth year of this course is largely academic, the successful completion of which will qualify a student for a Bachelor's degree (Bachelor of Science in Rehabilitation).

Both men and women are accepted. Recommended age of entry is 18-35 years, but exceptions may be made in special circumstances.

Academic Requirements

Grade 13 or completion of the First Year in the Faculty of Arts or Science at the University of British Columbia or its equivalent at another approved university. Required subjects are:

English 100 or equivalent

Mathematics 110 or 120 or Mathematics 101 (Grade 13)

Chemistry 101, 102 or 110

Biology 101 or Zoology 105 or Biology 100 (Grade 13)

One other credit course.

It is considered advisable for students to have some background in physics preferably, at least, to the Grade 12 (British Columbia) level.

Physical Fitness Requirements

Each applicant must present a certificate of physical fitness from a physician in accordance with the regulations of the University Health Service.

Personal Suitability

The Faculty reserves the right of selection of all students admitted to the School. Unless distance from the University makes it impractical, a personal interview is required prior to acceptance.

Application and Registration

- (a) *For new students.* A student applying for registration for the first time in the University must obtain from the Registrar's office an *Application for Admission* form and an application form for the School of Rehabilitation Medicine. The completed forms, together with necessary certificates in duplicate, two recent passport-type photographs, a medical certificate, and letters of reference, should be submitted to the Registrar's office by August 1.
- (b) *For students who have previously attended this University.* A student who has previously attended the University of British Columbia must obtain from the Registrar's office an application form for the School of Rehabilitation Medicine and submit it by August 1 to the Registrar's office together with one recent passport-type photograph, a medical certificate and letters of reference.

Further inquiries and the arrangements for a personal interview should be made to the School of Rehabilitation Medicine. Because of limitations on enrolment, it is advisable that students make early application.

Fees—subject to change without notice

First Term Fees, \$219 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$409 at time of registration. Fourth Year students are assessed an additional \$7 to cover the graduating fee.

Second Term Fees, \$190, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Students will receive a small interning salary during the summer sessions after second and third years.

Books and Supplies

Textbooks: Information regarding textbooks will be given during the first class period in each course.

Two white laboratory coats.

White shoes and stockings at the end of first year (regulation nurses' shoes).

Arrangements must be made through the school for the purchase of white uniforms, blue shorts, halter, and white cotton blouses.

Curriculum

First Year

Anatomy 390. Elementary Human Anatomy	3 units
Sociology 200. Introduction to Sociology	3 units
Zoology 303. Vertebrate Physiology	3 units

Rehabilitation Medicine Courses

100. Practical and Applied Anatomy I	2 units
101. Medicine I	1 unit

102. Surgery I (includes 15 hours Pathology)	1½ units
103. Psychiatry I	1½ units
Rehabilitation Therapy Courses	
104. Remedial Exercises I	3 units
105. Medical Electricity and Electrotherapy I	1½ units
106. Therapeutic Occupations I Laboratory	2 units
107. Therapeutic Occupations I	2 units
Second Year	
301. Sociology. Deviance	3 units
Rehabilitation Medicine Courses	
200. Practical and Applied Anatomy II	3 units
201. Medicine II	1½ units
202. Surgery II	½ unit
203. Psychiatry II	1½ units
Rehabilitation Therapy Courses	
204. Remedial Exercises II	4 units
205. Medical Electricity and Electrotherapy II	1 unit
206. Therapeutic Occupations II Laboratory	3 units
207. Therapeutic Occupations II	2 units
208. Clinical Training	1 unit
Third Year	
Rehabilitation Medicine Courses	
301. Medicine III (includes 15 hours Speech Pathology and Audiology)	1½ units
302. Surgery III	½ unit
303. Psychiatry III	1½ units
Rehabilitation Therapy Courses	
300. Practical and Applied Anatomy III	½ unit
304. Remedial Exercises III	3 units
305. Electro-, Thermo- and Hydrotherapy III	1 unit
306. Therapeutic Occupations III Laboratory	2 units
307. Therapeutic Occupations III	2 units
308. Supervision and Administration	½ unit
309. Clinical Training	4 units
Fourth Year	
315. Social Stratification	3 units
— Sociology. Elective	3 units
— Basic Design Course—School of Architecture	1 unit
— Elective	3 units
Rehabilitation Medicine Courses	
401. Medicine IV	1 unit
403. Psychiatry IV	1½ units
Rehabilitation Therapy Courses	
404. Physiotherapy IV	3 units
406. Occupational Therapy IV	3 units

Attendance

1. Students are required to attend all lectures and laboratory periods in each course. Admission to lectures or laboratories and credit for attendance may be refused by an instructor for lateness, misconduct, inattention or neglect of duty.

2. A student absent from classes because of illness must comply with the regulations of the University Health Service.

3. Unavoidable absence of one day or less for reasons other than sickness must be explained to the instructor or instructors concerned when the student returns. If absence is longer than one day, the student must receive a re-admission slip from the School of Rehabilitation Medicine office.

4. A student **planning** to be absent from classes for any reason must obtain previous permission from the School of Rehabilitation Medicine office.

Withdrawal.

Any student who after registration decides to withdraw from the University must report to the Registrar's office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted Honourable Dismissal or recommended, where applicable, for refund of fees.

Examinations and Advancement

1. Examinations in the School of Rehabilitation Medicine may be held at various times throughout the year, with final examinations being written at the end of each academic year. These examinations are obligatory for all students.

2. If a student is unavoidably absent from a sessional examination, he must notify the School of Rehabilitation Medicine office before the end of the examination period. Failure to observe this rule may result in the recording of a failure for the course.

3. When a sessional examination has been missed through illness or domestic affliction, application for a deferred examination or for special consideration must be made in writing to the School of Rehabilitation Medicine office not later than forty-eight hours after the close of the examination period. If the absence was for reasons of health, a physician's certificate indicating the nature and duration of the illness must be submitted to the University Health Service.

4. A student may be denied the privilege of writing a sessional examination in any subject because of unsatisfactory work or attendance, and may be considered to have failed in the course.

5. In a course which involves both laboratory work and written examinations, a student is required to make satisfactory standing in both parts. If the course is repeated, no exemption will ordinarily be granted from the work in either part.

6. Term essays and examination papers may be refused a passing mark if they are illegible or noticeably deficient in English.

7. (a) The minimum passing mark in any subject is 50%. Examinations will be graded as follows: First Class—80%; Second Class—65%; Pass—50%; Fail—below 50%.

(b) The Promotions Committee will determine a student's fitness for promotion at the end of each session.

(c) A student whose academic standing is unsatisfactory may be asked to withdraw from the School, or to repeat the entire work for the year.

(d) A student may not repeat more than one year.

(e) A student who fails twice will be required to withdraw from the University.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's office in order that arrangements may be made to meet the deadline.

Re-reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplemental Examinations

1. A student who obtains sufficiently high standing in his year may be permitted, on the recommendation of the Promotions Committee, to write supplemental examinations in any subject or subjects failed. Notice will be sent to all students who have been granted the privilege of writing supplemental examinations.

2. Application for supplemental examinations must be made to the Registrar by July 8.

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.00.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Descriptions of Courses

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 104 (3) under Rehabilitation Medicine indicates that Rehabilitation Medicine 104 is a three-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms	[2-3; 2-3]
1 lecture and 2 hours laboratory per week, first term	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term	[0-0; 1-2]
2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms	[2-3-2; 2-3-2]

Rehabilitation Medicine Courses

100. (2) Practical and Applied Anatomy I.—Laboratory course of study on the structure of the human body. Detailed gross anatomy of upper and lower extremities. Laboratory course will be spent in a study of prepared dissections. [0-4; 0-4]

200. (3) Practical and Applied Anatomy II.—Lecture and Laboratory course with emphasis on the structure of the nervous system. (Neuro-anatomy). [2-3; 2-2]

300. (½) Practical and Applied Anatomy III.—Continuation of study with detail on structure of systems and organs of particular importance to the therapist. [0-1; 0-0]

101. (1) Medicine I.—A series of lectures to be given by specialists in medicine, to introduce the student to the broad aspects of these disciplines and to an understanding of total medical care; to be followed by more detailed lectures and clinical demonstrations, covering various diseases that a therapist will meet in clinical practice, from a comprehensive point of view. [1-0; 1-0]

201. (1½) Medicine II.—A series of lectures and clinical demonstrations on various diseases. [2-0; 1-0]

301. (1) Medicine III.—A continuation of the series as indicated above, This also includes instruction in Speech Pathology and Audiology. [1-0; 1-0]

401. (1) Medicine IV.—Advanced course of study given by specialists in medicine to further enhance the therapist's understanding of total medical care. [1-0; 1-0]

102. (1½) Surgery I.—A course similar to Medicine 101, in which lectures will be given in Surgery and Pathology. [1-0; 2-0]

202. (½) Surgery II.—A continuation of the series given in 102. [1-0; 0-0]

302. (½) Surgery III.—More advanced series of lectures and clinical demonstrations on various diseases that therapists will meet clinically on a pre- and post-operative basis. [0-0; 1-0]

103. (1½) Psychiatry I (Growth and Development).—Lectures on genetics and behaviour, development of C.N.S., the family, personality development, and the life cycle. Clinical demonstrations relating to family and growth and development. [1-1; 1-1]

203. (1½) Psychiatry II (Introduction to Psychiatry).—Lectures on interviewing and group functions, normality, signs and symptoms, history of

psychiatry, and introduction to syndromes. Clinical—small group teaching on interviewing, signs and symptoms. [1-1; 1-0]

303. (1½) **Psychiatry III (Clinical Psychiatry)**.—Lectures—Etiology including psychodynamics, major syndromes including child psychiatry and mental retardation. Treatment procedures. Clinical experience with patients in a psychiatric setting under psychiatric and occupational therapy supervision. [1-0; 1-1]

403. (1½) **Psychiatry IV (Special topics)**.—Lectures—the role of the therapist in diagnosis, and treatment in the clinical team. Clinical—continuity with patients under supervision in a clinical setting. Experience in the role of the therapist in practice, taking some responsibility for patient care. [0-1; 0-0]. (plus additional block interning—8 weeks).

Rehabilitation Therapy

104. (3) **Remedial Exercises I**.—Lectures and practical classes will be given on the basic principles of movement, body mechanics, posture, and methods of progression of remedial exercises. A practical course on identification of anatomical structures that can be palpated will be included, together with massage techniques that may be used in medical and surgical conditions, and early re-education in movement. Applying these principles an introduction is made to the treatment of certain medical and surgical conditions such as arthritis, fractures and orthopedics. [2-2; 2-2]

204. (4) **Remedial Exercises II**.—A series of lecture-demonstrations and practical classes will be given related to the treatment procedures which may be used in the conditions discussed in lectures on rehabilitation medicine and surgery; will include posture, neurological disorders, further study of fractures and other orthopedic conditions. [2-4; 2-2]

304. (3) **Remedial Exercises III**.—Seminars and practical classes will be given which will correlate with clinical experience which is in progress. Further study on pre- and post-operative treatment in thoracic and neurosurgery, cerebral palsy and the training of the mother during pre- and post-natal periods. [2-3; 2-4]

404. (3) **Remedial Exercises IV**.—Advanced seminar course in which case study evaluations will be presented and new concepts of treatment procedure will be discussed. [0-3; 0-3]

105. (1½) **Medical Electricity and Electrotherapy**.—Mechanics of movement including levers and pulleys. Basic physics of electricity, which is then related to basic production of currents used in electrotherapy. Practical classes relating to the application of constant current and interrupted current for stimulation of nerve and muscle. Infra-red techniques, wax baths, and an introduction to short-wave treatment will also be included. [2-1; 1-1]

205. (1) **Medical Electricity and Electrotherapy II**.—Lectures, demonstrations and practical classes on production and application of short-wave, ultraviolet and further consideration of stimulating currents. [1-1; 1-1]

305. (1) **Electro-, Thermo- and Hydrotherapy III**.—A series of lecture-demonstrations and practical classes on the production and therapeutic use of ultra-sonics, micro-wave diathermy and special ionizations. Theory and application of hydrotherapy. [1-1; 0-1]

106. (2) **Therapeutic Occupations I. Laboratory**.—Practical classes in techniques used in instruction and practical application of the basic techniques

of ceramics, woodworking, needlework, rugmaking, basketry and seagrass seating. [0-3; 0-3]

206. (3) Therapeutic Occupations II. Laboratory.—Practical classes in additional techniques such as weaving, cordwork, metalwork, leatherwork, and construction of remedial adaptations for tools and equipment. [0-6; 0-5]

306. (2) Therapeutic Occupations III. Laboratory.—Practical classes of instruction in techniques used in children's hospitals, pre-vocational assessment, retraining the disabled homemaker, designing and fabrication of self-help devices. [0-4; 0-4]

406. (3) Therapeutic Occupations IV.—Practical classes in application and further practise in techniques covered in previous three years. Some research and refinement of techniques will be special projects. [0-3; 0-3]

107. (2) Therapeutic Occupations I.—Lectures introducing theory, scope and general principles of occupational therapy. These lectures correlate the use of the therapeutic activities as they apply to the medical, surgical and psychiatric aspects of rehabilitation. [1-0; 1-0]

207. (2) Therapeutic Occupations II.—Lectures dealing with methods of occupational therapy in rehabilitation for the physically disabled and psychiatric patients. Stress is placed upon the use of adapted equipment, self-help devices and training of the amputee. [2-0; 2-0]

307. (2) Therapeutic Occupations III.—Lectures on further aspects of rehabilitation. [2-0; 2-0]

208. (1) Clinical Training.—Three half-days a week in the spring term will consist of observation and supervised participation in Physical and Occupational Therapy Departments in local hospitals and rehabilitation centres. [0-0; 0-10½]

308. (4) Clinical Training.—Five half-days a week in both terms will consist of supervised participation in rehabilitation procedures in the Physical and Occupational Therapy Departments of the Vancouver hospitals and rehabilitation centres. [0-17½; 0-17½]

309. (½) Supervision and Administration.—Lecture course on methods of supervising staff and students in training as well as department management and organization. [1-0; 0-0]

— (½) Basic Design course.—(School of Architecture). An understanding of principles of design as applied to the construction of adapted equipment, to designing self-help devices, and to structural alterations in the home or community buildings for the handicapped patient. [1-0; 1-0]

Courses in other Faculties

Anatomy

390. (3) **Elementary Human Anatomy.**—An elementary course dealing with the basic structure of the human body. Prerequisites: Chemistry 101 or 102 or 110, and Biology 101 or Zoology 105 or equivalent. [3-0; 3-0]

Physiology

303. (3) **Elementary Vertebrate Physiology.**—Introductory organic physiology for students not taking the Major or Honours B.Sc. programme. Prerequisite: First Year Chemistry. Students will get credit for one only of Zoology 303, 304, and Biology 400. [2-2; 2-2]

Sociology

200. (3) **Introduction to Sociology.**—A general introduction to the sociological analysis of selected topics (such as religion, work, politics, stratification, bureaucratic organizations, kinship, socialization, and particular social roles. [3-0; 3-0]

301. (3) **Deviance.**—Forms of deviance from an institutional order; the social roles of deviants; attitudes towards non-conformity, punishment and cure; evasion of rules; contributions of deviance to the functioning of social systems. [3-0; 3-0]

306. (3) **Socialization.**—Analysis of the acquisition and loss of membership in social groups, stages in the learning of social roles, and of the institutions concerned with the socialization of adults and children. [3-0; 3-0]

315. (3) **Social Stratification.**—The study of tendencies toward equality and inequality. Manifestations of inequality — occupation, education, ethnic group, income power — and their consequences. Theories of social class; functionalist, neo-Marxist, etc. [3-0; 3-0]

522. (3) **Small Groups.** [3-0; 3-0]

The hours quoted in the above description are based on a thirty-week year. Additional hours are taught in blocks during the extra two-three weeks of each year of the course. This allows an additional seventy hours in Occupational Therapy subjects and forty hours in Physiotherapy.

Nursing week: One week will be spent on the wards in hospitals observing and assisting in nursing programmes.

Clinical Practice: Clinical training will be given in accredited departments under University appointed physicians, surgeons and therapists. Equal experience will be offered in physical and occupational therapy in rehabilitation centres, mental health institutions, and home visiting services, as well as in general hospital physical medicine departments.

8 weeks between First and Second Years	—	304 hours	3 units
12 weeks between Second and Third Years	—	456 hours	3½ units
16 weeks at end of Third Year		608 hours	4½ units
Included within academic years (see curriculum)		675 hours.	

General Professional Information

On successful completion of the Third Year, a student is eligible to apply for membership in the Canadian Association of Occupational Therapists and/or the Canadian Physiotherapy Association. These Associations have world-wide affiliations. Information regarding the profession may be obtained from:

The Canadian Physiotherapy Association,
64 Avenue Road,
Toronto 5, Ontario.

The Canadian Association of Occupational Therapists,
331 Bloor Street West,
Toronto 5, Ontario.

As these Associations set the regulations regarding interning periods, the University of British Columbia will not be responsible for any changes that may occur from time to time in these regulations.

BURSARIES

Canadian Arthritis and Rheumatism Society—Repayable and non-repayable bursaries. Information may be obtained from the Canadian Arthritis and Rheumatism Society (British Columbia Division), 645 West Broadway, Vancouver 9, B.C.

Canadian Physiotherapy Association, British Columbia Branch—Two bursaries of \$50 each, the gift of the members of the Canadian Physiotherapy Association, British Columbia Branch, will be awarded to second and third year students who have good scholastic standing and are in need of financial assistance. Application for the above should be made in November of the academic year to: School of Rehabilitation Medicine, University of British Columbia, Vancouver 8, B.C.

1966-67

**THE FACULTY
OF
PHARMACY**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**

The Faculty of Pharmacy calendar, 1966-67

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ACADEMIC STAFF

- A. WHITNEY MATTHEWS, B.Sc. (Pharm.), M.Sc. (Alta.), Ph.D. (Florida), Professor and Dean of the Faculty.
- FINLAY A. MORRISON, M.B.E., C.D., B.S.P. (Sask.), M.Sc. (Maryland), Professor of Pharmaceutics and Assistant to the Dean (on leave of absence July 1, 1965 to June 30, 1966).
- JOHN E. HALLIDAY, B.S.P. (Sask.), M.S. (Purdue), Ph.D. (Wash.), Associate Professor of Pharmacology.
- MODEST PERNAROWSKI, B.S.P. (Sask.), M.S. (Purdue), Ph.D. (Purdue), Associate Professor of Pharmaceutical Chemistry.
- TERENCE H. BROWN, B.S.P. (Brit. Col.), M.S., Ph.D. (Wash.), Assistant Professor of Pharmaceutical Chemistry.
- ALLAN M. GOODEVE, Phm.B. (Toronto), B.S.P. (Sask.), M.Sc.Phm. (Toronto), Ph.D. (Purdue), Assistant Professor of Pharmacognosy.
- JANIS O. RUNIKIS, M.S., Ph.D. (Wash.), Assistant Professor of Pharmaceutics.
- J. GLEN MOIR, B.S.P. (Brit. Col.), M.S. (Michigan), Assistant Professor of Pharmaceutics and Hospital Pharmacy.
- FRANK S. ABBOTT, B.S.P., M.S. (Sask.), Ph.D. (Purdue), Assistant Professor of Pharmaceutical Chemistry.
- MRS. LEONA R. GOODEVE, B.S.P. (Sask.), M.Sc.Phm. (Toronto), Instructor in Pharmaceutics.
- NORMAN C. ZACHARIAS, B.S.P. (Brit. Col.), Instructor in Pharmaceutics.
- DOUGLAS A. DENHOLM, B.S.P. (Brit. Col.), Lecturer (Part-time).
- GORDON B. HEWITT, B.A., B.S.P. (Brit. Col.), Lecturer (Part-time).

Members of Faculty representing other Departments:

J. J. Stock, B.S.A., M.Sc., Ph.D.; S. H. Zbarsky, B.A., M.A., Ph.D.; L. D. Hayward, B.A., Ph.D.; Mrs. H. M. Clarke, Phm.B., B.A., M.A.; D. J. Randall, B.Sc., Ph.D.; D. B. Fields, B.Com., M.B.A., F.C.A.

THE FACULTY OF PHARMACY

The Faculty of Pharmacy offers courses leading to the degree of Bachelor of Science in Pharmacy (B.S.P.) and to the degree of Master of Science in Pharmacy (M.S.P.). (The hood is dark green with scarlet cord.)

Programme of Study

The course in Pharmacy leading to the Bachelor of Science in Pharmacy degree is designed to prepare graduates to enter a wide variety of careers associated with pharmacy in retail establishments and hospitals, in industry and government service and other specialized fields. This course satisfies the requirement of the Pharmacy Act for academic qualification for licensing in the Province of British Columbia. It also meets the requirements of the standard curriculum as approved by the Canadian Conference of Pharmaceutical Faculties.

Admission

The general requirements for admission to the University are given in the General Information bulletin.

For admission to Pharmacy it is required that the student shall have completed the First Year in Arts or Science with credit for the courses shown below and an average grade of at least 60%, or that he shall have fulfilled the equivalent of these requirements by Grade 13 or junior college, or by equivalent work taken in an approved university. (Students planning to enter Pharmacy are advised to present Chemistry 12, Mathematics 12 and either Physics 12 or Biology 12 for High School graduation.)

The required subjects are Chemistry 101 or 102 or 110; English 100 (Literature and Composition); Mathematics 110 or 120 (or Grade 13 Mathematics 101), one of Physics 110 or 101 or 103, or Zoology 105 or Biology 101 (or Grade 13 Biology 100), and one optional subject to be chosen from Economics 100, French 110 or 120, Geography 100, 101, German 100 or 110 or 120 or 130, History 100 (or 101 or 102 from Grade 13), Latin 100 or 110 or 120, Music 105, Philosophy 100, Polish 110, Psychology 100, Russian 100, Spanish 100.

Candidates who expect to complete the requisite entrance standing through University or Grade 13 (British Columbia) supplemental examinations, held in August, may apply for admission and their applications will be considered subject to the results of these examinations.

Students, with otherwise satisfactory standing, who have credit for Chemistry 101 or 110 but lack a second required science course, may be admitted to the course but must consult the Dean's Office with regard to an approved programme of electives. Students transferring to the course from another faculty or university, and who have prerequisites equivalent to those outlined above also must consult the Dean's Office with regard to an approved programme of electives.

Advanced Standing: Any student who has taken scheduled courses or their equivalent in another faculty or university may, upon application, be granted such standing as the Faculty may determine.

Students who have completed the equivalent of second year Science may be admitted to the second year of Pharmacy and will take Pharmacy 110 and 210 concurrently.

Because of limited accommodation, the number of students admitted to the First Year in the Faculty of Pharmacy may be restricted to 75.

Master of Science in Pharmacy course: see Faculty of Graduate Studies calendar.

Fees—Subject to change without notice

	First Term	2nd Term	Total
First Year	\$243	\$214	\$457
Other Years	282	253	535

First Term fees, which includes the A.M.S. fee of \$29, are payable in full at the time of registration. However, students may pay full fees at time of registration.

Fourth Year students are assessed an additional \$7 to cover the graduating fee.

Second Term Fees are payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting Office before this date with a note showing name and registration number.

Partial Students—Consult the General Information bulletin.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may be excluded from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students, who because of illness are absent from a December or April examination, must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's Office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees. (See General Information bulletin.)

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

Requirements for Licensing

The possession of a B.S.P. does not, in itself, confer the right to practise pharmacy in any province of Canada. In order to practise Pharmacy in the Province of British Columbia it is necessary to be registered as a member of the Pharmaceutical Association of the Province. The requirements for such registration include fifty-two weeks of practical training of which all but thirteen weeks may be completed prior to graduation from the Faculty. The bylaws of the Council of the Pharmaceutical Association provide that every person desirous of becoming a registered student of the Association shall, before commencing his period of practical training or his attendance at the

Faculty of Pharmacy, send to the Registrar of the Pharmaceutical Association an application on the form provided by the Association, together with the fee for such registration.

Details of these requirements may be obtained from the Registrar of the Pharmaceutical Association, 410 Dominion Bank Bldg., 207 West Hastings St., Vancouver 3, B.C.

Pharmacy Examining Board of Canada

The Pharmacy Examining Board of Canada was created by Federal Statute, assented to on December 21, 1963, to establish qualifications for pharmacists acceptable to participating Pharmacy licensing bodies. The Board provides for annual examinations and issues a certificate to the successful candidate which may be filed with a Canadian provincial licensing body in connection with an application for licence to practise Pharmacy under the laws of that province. Attainment of the Board's certificate is an indication of academic qualification and is to be considered an achievement of merit.

Information relative to the dates of examinations, application forms, etc., may be obtained through the Dean's office.

Examinations and Advancement

1. Examinations are held in December and April. December examinations are obligatory in all subjects of the First and Second Years and in all courses which are terminal at this time. April examinations are obligatory for all students. Applications for special consideration on account of illness or domestic affliction must be submitted in writing to the Dean not later than two days after the close of the examination period. (See the General Information bulletin.)
2. The passing mark is 50 per cent. in each subject and successful candidates taking the number of units required in any one year will be graded as follows: First Class, an average of 80 per cent. or over; Second Class, 65 to 80 per cent.; Pass, 50 to 65 per cent.
3. In any course which involves laboratory work, a student must complete the laboratory assignments with a satisfactory record before being admitted to the written examination of the course. A student may be required by the Faculty to discontinue such a course during any term if he fails to maintain a satisfactory standing in laboratory work, or if he is absent from an appreciable number of laboratory periods through illness or other causes.
4. Students who fail for a second time in a year's work will be required to withdraw.
5. Students who have failed to complete the requirements of any one year will be permitted to register only in courses in the succeeding year for which they have the necessary prerequisites.
6. Students will not be permitted to register in more than eighteen units in any one year without the special permission of the Dean.
7. Any student whose academic record, as determined by the tests and examinations of the first term, is found to be unsatisfactory, may be required to discontinue attendance at the University for the remainder of the session.
8. Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the deadline.

Re-Reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplementals

1. A student who has obtained an average of at least 50 per cent. in the final examinations of the session may be granted supplemental examinations in the subject or subjects in which he has failed provided he has obtained a final grade of not less than 40 per cent. Notice will be sent to students to whom such supplemental examinations have been granted.
2. In any one session no candidate will be granted supplemental privileges in more than 3 units.
3. A student who has failed in more than 6 units of a required year's work will be considered to have failed in the work of that year, and will not receive credit for any of the courses passed in that year.
4. If a supplemental granted in a course is passed with a grade of at least 50 per cent. credit will be given for the course. In the computation of the overall average in the work of a session or for a degree, the grade in a supplemental, if passed, will be considered as 50 per cent. Similarly, the overall average will not be changed if a subject already passed is written for higher standing.
5. In all but the Final Year a candidate who has been granted a supplemental may write it only once. If he fails, he must repeat the course or take a permissible substitute. In the Final Year he may write it twice.

6. Supplemental examinations will be held in August. Applications must be made in the Office of the Registrar on or before July 8, and must be accompanied by the required fee.

Supplemental examinations may be written in August at the following centres:

Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penticton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.00.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of other examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agents or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Dismissal indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free of charge, except following graduation when the first three are free of charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

CURRICULUM
First Year

Subject	First Term		Second Term	
	Lect.	Lab.	Lect.	Lab.
¹ Chem. 205, Physical Inorganic and Analytical Chemistry	2	4	2	4
³ Chem. 230, Organic Chemistry	3	3	3	3
English 150, Composition	2	—	2	—
Pharmacy 110, Introduction to Pharmacy	2	—	2	—
² Physics 103, Elementary Physics, or	3	2	3	2
² Biology 101, Principles of Biology	3	3	3	3
Non-Science Elective	3	—	3	—

¹Chem. 200 will be accepted.

²The student presenting Physics as an entrance requirement will take Biology in this year and vice-versa.

³Chemistry 230 is a prerequisite for all subsequent Pharmacy courses with the exception of Pharmacy 210 and 350.

Second Year

Subject	First Term		Second Term	
	Lect.	Lab.	Lect.	Lab.
Microbiol. 200, Introductory Microbiology	3	2	3	2
Zoo. 304, Vertebrate Physiology	2	3	2	3
Econ. 200, Principles of Economics	3	—	3	—
Eng. 250, Reading and Composition	2	—	2	—
Pharm. 210, Pharmaceutical Technology	2	3	2	3
Pharm. 220, Pharmaceutical Chemistry	3	4	3	4
Pharm. 230, Introductory Pharmacognosy and Biopharmacy	—	—	2	—

Third Year

Subject	First Term		Second Term	
	Lect.	Lab.	Lect.	Lab.
Biochem. 410, Principles of Biochemistry	3	3	3	3
English 305, Literature of Ideas	1	1	1	1
Pharm. 310, Theoretical Pharmaceutics	2	3	2	3
Pharm. 320, Organic Medicinal Products	3	—	3	—
Pharm. 330, General Pharmacognosy	3	3	3	3
Pharm. 340, General Pharmacology	3	3	3	0
Pharm. 350, Pharmaceutical Law and Ethics	1	—	1	—

Fourth Year

Subject	First Term		Second Term	
	Lect.	Lab.	Lect.	Lab.
Pharm. 410, Compounding and Dispensing....	2	—	2	—
Pharm. 411, Prescription Practice	—	4	—	4
Pharm. 420, Drug Identification and Synthesis	—	4	—	4
Pharm. 440, Applied Pharmacology	2	1	2	1
*Pharm. 450, Selected Topics	1	—	1	—
Non-Science Elective	3	—	3	—
†Electives (see below)				

*A graduation essay or a thesis, acceptable to the Faculty, will be required of all students.

†The student will be expected to choose a field of specialization from those listed below and to select his elective courses, with the approval of the Dean, from an approved group of courses in one of these options.

Option 1.—For those students planning a career in retail pharmacy or other fields of drug distribution. In this option the 9 units of electives must include Commerce 358 (2 units).

Option 2.—For those students planning a career in hospital pharmacy. In this option the 9 units of electives must include Commerce 358 (2 units).

Option 3.—For those students planning a career in product development and control, or in the government service.

Option 4.—For those students planning to proceed to graduate study.

COURSES OF INSTRUCTION

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 310 (3) indicates that Pharmacy 310 is a three-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms.	[2-3; 2-3]
1 lecture and 2 hours laboratory per week, first term.	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term.	[0-0; 1-2]
2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms.	[2-3-2; 2-3-2]

An asterisk (*) indicates alternate weeks.

Pharmaceutics

110. (2) **Introduction to Pharmacy.**—Orientation, pharmacy organizations, various fields in Pharmacy; pharmaceutical terminology; the literature of pharmacy; metrology and pharmaceutical mathematics. [2-0; 2-0]

210. (3) **Pharmaceutical Technology.**—Procedures, basic principles and processes involved in the production of official and non-official preparations. Prerequisite: Chemistry 205. [2-3; 2-3]

310. (3) **Theoretical Pharmaceutics.**—A study of physical-chemical concepts as they apply to pharmaceutical systems. (Prerequisite: Pharmacy 210.) [2-3; 2-3]

410. (2) **Compounding and Dispensing.**—A study of extemporaneous compounding procedures; discussion of prescription specialties. [2-0; 2-0]

411. (1) **Prescription Practice.**—Reading, compounding and dispensing of prescriptions. (Pharmacy 410 must be taken concurrently.) [0-4; 0-4]

412. (2) **Sterile Pharmaceutical Products.**—A study of theory and methods of sterilization, and the considerations involved in the preparation of various types of sterile products. [0-0; 2-4]

414. (3) **Problems in Pharmaceutics.**—Individual assignments involving library and laboratory investigation of problems involved in the development of pharmaceutical dosage forms. [0-6; 0-6]

415. (2) **Product Design and Product Evaluation.**—A study integrating more recent developments in the pharmaceutical and medical sciences into the formulation and evaluation of pharmaceutical products. [2-0; 2-0]

416. (3) **Pharmaceutical Manufacturing.**—The formulation and production of pharmaceuticals and a study of industrial processes and equipment used in large-scale production. Laboratory includes some individual formulation problems. Registration limited. [2-4; 2-4]

417. (2) **Cosmetology and Cosmetic Formulation.**—A study of the structure and physiology of the skin and its appendages, and advanced scientific information on selected cosmetic preparations, their manufacture and methods of evaluation. Laboratory includes some individual formulation exercises. [0-0; 3-2]

Pharmaceutical Chemistry

220. (3) **Pharmaceutical Chemistry.**—An introduction to the quality control and analysis of drugs in dosage form; separatory techniques used in drug analysis; measurement techniques of importance in the quality control of drugs, including an introduction to colorimetry, potentiometry, and ultraviolet and infrared spectrophotometry; the use of radioisotopes in

pharmaceutical research. Prerequisites: Chemistry 205 or 200, and Chemistry 230. [3-4; 3-4]

320. (3) Organic Medicinal Products.—The chemistry of natural and synthetic organic medicinal compounds and their physico-chemical relationships; the relation of chemical structure to biological activity. [3-0; 3-0]

420. (1) Drug Identification and Synthesis.—A laboratory course involving the identification and synthesis of representative organic drugs. [0-4; 0-4]

424. (2) Quality Control.—A survey course involving discussions of various methods of analysis and control. Selected demonstrations will be given to illustrate various procedures. [2-0; 2-0]

425. (3) Drug Testing and Assaying.—Advanced analytical techniques applied to pharmaceutical preparations including photometric, fluorimetric, chromatographic and electrotitrimetric; assay of official and non-official preparations involving special techniques. Registration limited. [1-4; 1-4]

426. (3) Problems in Pharmaceutical Chemistry.—Individual problems relating to the synthesis, identification and assay of medicinal compounds. [0-6; 0-6]

427. (2) Topics in Medicinal Chemistry.—A more detailed study of the relation of chemical and physical properties and structure to biological activity. The groups of drugs to be discussed will vary from year to year. (Prerequisite: Pharmacy 320.) [2-0; 2-0]

Pharmacognosy

230. (1) Introductory Pharmacognosy and Biopharmacy.—A survey of sources of medicinally useful natural products. Biological, chemical and therapeutic classification of drug products. A study of immunizing biologicals, blood derivatives and allergens. [0-0; 2-0]

330. (3) General Pharmacognosy and Biopharmacy.—A study of products of plant and animal origin currently used in pharmacy and medicine; sources, constituents, isolation, production, physico-chemical properties, storage, standardization and uses. [3-3; 3-3]

434. (3) Problems in Pharmacognosy.—Individual library and laboratory investigations related to the isolation and the study of physical and chemical properties of compounds derived from biological sources. [0-6; 0-6]

437. (2) Topics in Pharmacognosy.—Topics chosen from such areas as biosynthesis of natural products, microbiological transformation products, isolation and purification methods, commercial aspects of crude drug production and other areas of current interest. (Prerequisite: Pharmacognosy 330.) [2-0; 2-0]

Pharmacology

340. (3) General Pharmacology.—A study of pharmacological principles; the actions of drugs on organs and tissues and the toxic effects of drugs. Prerequisite: Zoology 304. [3-0; 3-3]

435. (1) Pesticides.—Physiological action and chemical properties of insecticides, rodenticides, weedicides, etc. [2-0; 0-0]

440. (2) Applied Pharmacology.—Therapeutic applications of drugs. Important diseases and the role of drugs in their treatment will be discussed. Emphasis will be placed on potential dangers and possible toxic reactions of drugs. Various types of literature dealing with drug therapy will be studied and oral reports presented. Prerequisite: Pharmacy 340. [2-1; 2-1]

444. (3) **Problems in Pharmacology.**—Individual assignments involving library and laboratory investigation of certain aspects of drug action. [0-6; 0-6]
445. (1) **Animal Hygiene.**—Management and disease prevention; drugs used in common animal and poultry diseases. [0-0; 2-0]

Pharmacy Administration

350. (1) **Pharmaceutical Law and Ethics.**—Early legislation pertaining to pharmacy; Provincial and Federal legislation affecting the practice of pharmacy; ethical principles and responsibilities. [1-0; 1-0]
450. **Selected Topics.**—A series of lectures designed to introduce students to various special aspects of pharmaceutical practice. Thesis or Essay. No unit value.
454. (2) **Hospital Pharmacy Administration.**—History, development and organization of hospitals; supervision, control and economics of hospital pharmacy; and related topics. Field work and field work conferences will be conducted during the second term. [2-0; 1-3]
455. (2) **Community Health.**—The relationship of the practising pharmacist to community health and community health practices. [2-0; 2-0]

Courses for Graduate Studies

501. (3) **Physical and Chemical Aspects of Pharmaceutical Systems.**—A study of problems in formulation, production, stabilization, and preservation of pharmaceuticals. Laboratory demonstrations and special assignments may be included in the course.
520. (2) **Advanced Medicinal Chemistry.**—Conferences and supervised reading in the literature of medicinal chemistry. A consideration of recent theoretical advances in medicinal chemistry.
530. (2) **Advanced Pharmacognosy.**—A detailed study of selected compounds of biological origin useful in the fields of Pharmacy and Medicine.
540. (2) **Topics in Pharmacology.**—Lectures and supervised studies in selected areas of pharmacology.
548. (1) **Seminar.**—Attendance at regular seminars throughout the session and presentation of one or more papers on selected topics.
549. (6) **Master's Thesis.**
550. (1-3) **Directed Studies.**

Required Courses from Other Faculties:

Biochemistry

410. (3) **Principles of Biochemistry.**—A lecture course dealing with the structure, function and metabolic reactions of proteins, carbohydrates, nucleic acids, lipids and steroids; enzymology and bio-energetics; biochemical transfer of genetic information and protein synthesis; regulatory mechanisms; control of cellular activity. Prerequisite: Chemistry 203 or 230. [3-3; 3-0]

Biology

101. (3) **Principles of Biology.**—An introductory course emphasizing principles of wide application to all living organisms, including cell structure and function, the mechanism of inheritance, evolution, and adaptation to environ-

ment. A comparative approach to the unity and diversity of organisms will be stressed. A one hour tutorial is required each week for those students who have not previously had Biology 11 or its equivalent in high school. [3-3; 3-3]

Chemistry

205. (3) **Physical-Inorganic and Analytical Chemistry.**—Systematic inorganic chemistry, properties of matter from a molecular standpoint, equilibria in solution, physical chemistry useful in biological, medical, agricultural, and related sciences. [3-4; 3-4]

230. (3) **Organic Chemistry.**—The fundamental principles of modern organic chemistry including a discussion of the main classes of organic compounds. Prerequisite: Chemistry 110 or 102 or 101. [3-3; 3-3]

Commerce

358. (2) **Elements of Accounting.** (For Pharmacy students only.)—Accounting systems suitable for pharmacists' use; inventory records; departmental accounting; branch accounting; computation of losses and gains; elementary tax problems. [2-0; 2-0]

Economics

200. (3) **Principles of Economics.**—The institutions and processes involved in the production and distribution of wealth; basic determinants of prices and costs, the determinants of income and employment; international trade. [3-0; 3-0]

English

150. (2) **Composition.**—The work consists of (1) essays, class exercises, and selected reading; (2) written examinations. Students will be required to make a passing mark in each. [2-0; 2-0]

250. (2) **Reading and Composition.**—Students will be asked to read a half-dozen notable books and to write essays on the ideas they encounter.

305. (2) **Literature of Ideas.**—Students will be asked to read a half-dozen texts illustrating the theme of Utopian society. Seminars and essays will be required. [1-1; 1-1]

Microbiology

200. (3) **Introductory Microbiology.**—History of bacteriology; bacteria in nature; classification of bacterial forms; methods of culture and isolation; relation of bacteria to agriculture, industry, veterinary science, public health and sanitation. Prerequisites: Chemistry 101 or 102 or 110; and Biology 101 or equivalent. [3-2; 3-2]

Physics

103. (3) **Elements of Physics.**—From Newton's mechanics to particle physics, a description of ideas, principles and their applications. [3-3*; 3-3*]

Zoology

304. (3) **Physiology.**—Restricted to students who have successfully completed the second year requirements of the Major or Honours programme in Biology or Zoology. Students will get credit for one only of Zoology 303 and 304. [2-3; 2-3]

**THE FACULTY
OF
SCIENCE**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**



The Faculty of Science calendar, 1966-67

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For topics not listed above, consult the General Information bulletin.

Financial Assistance

A list of Fellowships, Scholarships, Bursaries and Loans open to students in the University will be found in the publication "Awards and Financial Assistance" which may be obtained from the Registrar's office. For details, consult this publication. *In general, application must be made to the Dean of Inter-Faculty and Student Affairs.*

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Department of Microbiology

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 C. E. DOLMAN, M.R.C.S. (England), M.B., B.S., D.P.H., Ph.D., F.R.C.P. (London), F.R.C.P.(C), F.A.P.H.A., F.R.S.C., Research Professor.
 D. C. B. DUFF, M.A., Ph.D. (Toronto), Professor.
 C. C. WALDEN, B.A., M.A. (Sask.), Ph.D. (Minn.), Honorary Professor.
 J. E. BISMANIS, M.D., Dip. Bact. (U. of Latvia, Riga), Associate Professor.
 W. E. RAZZELL, B.A. (Brit. Col.), Ph.D. (Illinois), Associate Professor.
 J. J. STOCK, B.S.A. (Ont. Agric. Coll.), M.Sc., Ph.D. (McGill), Associate Professor.
 MRS. JULIA GERWING, B.A. (Brit. Col.), Ph.D. (London), Assistant Professor.
 MRS. A. F. GRONLUND, B.A., M.Sc., Ph.D. (Brit. Col.), Assistant Professor.
 S. E. JUHASZ, M.D. (Budapest), Ph.D. (McGill), Assistant Professor.
 MRS. MARY S. LAMB, B.A. (Brit. Col.), Instructor.
 MISS D. SYEKLOCHA, B.A. (Brit. Col.), M.Sc., Ph.D. (McGill), Lecturer.
 MRS. OLGA VOLKOFF, B.A., M.A. (Brit. Col.), Lecturer.
 M. WEINTRAUB, B.A., Ph.D. (Toronto), Honorary Lecturer.

Department of Physics

- GEORGE M. VOLKOFF, M.B.E., M.A. (Brit. Col.), Ph.D. (Calif.), D.Sc. (Brit. Col.), F.R.S.C., Professor and Head of the Department.
 GORDON M. SHRUM, O.B.E., M.M., E.D., M.A., Ph.D. (Toronto), D.Sc. (McMaster, Brit. Col.), F.R.S.C., Honorary Professor.
 A. M. CROOKER, B.A. (McM.), M.A., Ph.D. (Toronto), Professor.
 KENNETH C. MANN, O.B.E., B.A. (Sask.), M.A., Ph.D. (Toronto), Professor.
 J. B. WARREN, B.Sc., D.I.C., Ph.D. (London), F.Inst.P., F.R.S.C., Professor.
 RONALD E. BURGESS, B.Sc. (London), F.R.S.C., Professor.
 GEORGE L. PICKARD, M.B.E., M.A., D.Phil. (Oxon.), F.R.S.C., Professor.
 W. OPECHOWSKI, Mag.Fil. (Warsaw), F.R.S.C., Professor.
 FRIEDRICH A. KAEMPFER, Dipl.Phys., Dr. Rer. Nat. (Göttingen), Professor.
 ROBERT W. STEWART, M.Sc. (Queen's), Ph.D. (Cantab.), Professor.
 M. BLOOM, M.Sc. (McGill), Ph.D. (Illinois), Professor.

- G. M. GRIFFITHS, B.A.Sc. (Toronto), M.A., Ph.D. (Brit. Col.), Professor.
 ROBERT BARRIE, B.Sc., Ph.D. (Glasgow), Professor.
 E. W. VOGT, B.Sc., M.Sc. (Man.), Ph.D. (Princeton), Professor.
 D. TER HAAR, B.Sc., M.A., M.Sc., Dr.Sc. (Leyden), D.Sc. (Oxon.), F.R.S.E.,
 F.R.A.S., Visiting Professor (Feb.-Aug. 1966).
 A. J. BARNARD, M.Sc. (Rhodes, S.A.), Ph.D. (Glasgow), Associate Professor.
 J. W. BICHARD, B.A.Sc. (Toronto), Ph.D. (N. Dame), Associate Professor.
 R. W. BURLING, M.Sc. (New Zeal.), Ph.D. (London), Associate Professor.
 F. L. CURZON, B.Sc., A.R.C.S., D.I.C., Ph.D. (London), Associate Professor.
 F. W. DALBY, B.Sc. (Alta.), M.A. (Brit. Col.), Ph.D. (Ohio State), Associate
 Professor.
 K. L. ERDMAN, B.A., M.Sc. (Alta.), Ph.D. (Brit. Col.), Associate Professor.
 GARTH JONES, B.A., M.Sc., Ph.D. (Brit. Col.), Associate Professor.
 D. L. LIVESSEY, B.A., Ph.D. (Cantab.), Associate Professor.
 ROY NODWELL, B.E. (Sask.), M.A.Sc., Ph.D. (Brit. Col.), Associate Professor.
 P. RASTALL, B.Sc., Ph.D. (Manchester), Associate Professor.
 L. DE SOBRINO, M.Sc., Sc.D. (Mass. Inst. of Tech.), Associate Professor.
 B. L. WHITE, B.Sc. (New Zeal.), D.I.C., Ph.D. (London), Associate Professor.
 D. LI. WILLIAMS, B.Sc. (N. Wales), Ph.D. (Cantab.), Associate Professor.
 R. C. WILLIAMS, B.Sc. (Man.), M.Sc. (McGill), Ph.D. (Man.), Associate
 Professor.
 B. AHLBORN, Dipl. Phys. (Kiel), Dr. Rer. Nat. (Munich), Assistant Professor.
 M. K. CRADDOCK, M.A., D.Phil. (Oxon.), Assistant Professor.
 P. R. CRITCHLOW, B.A., D.Phil. (Oxon.), Assistant Professor.
 M. J. CROOKS, B.A. (Reed), M.A. (Brit. Col.), Ph.D. (Yale), Assistant Pro-
 fessor.
 BETTY DANIELS, B.Sc. (London), D.Phil. (Oxon.), Assistant Professor.
 ROSALIA GUCCIONE, B.Sc. (Palermo), M.Sc., Ph.D. (Brit. Col.), Assistant Pro-
 fessor.
 ROGER HOWARD, B.Sc., Ph.D. (Nott.), Assistant Professor.
 P. H. LE BLOND, B.A. (Laval), B.Sc. (McGill), Ph.D. (Brit. Col.), Assistant
 Professor.
 P. W. MARTIN, B.Sc., Ph.D. (Glasgow), Assistant Professor.
 P. W. MATTHEWS, B.Sc., Ph.D. (Brist.), Assistant Professor.
 J. M. McMILLAN, M.Sc. (Brit. Col.), Ph.D. (McGill), Assistant Professor.
 C. F. SCHWERDTFEGER, B.S. (Villanova), Ph.D. (N.Dame), Assistant Pro-
 fessor
 W. L. H. SHUTER, B.Sc., M.Sc. (Rhodes), Ph.D. (Manchester), Assistant Pro-
 fessor.
 P. J. SYKES, B.A. (Brit. Col.), M.A. (Calif.), Assistant Professor.
 C. P. S. TAYLOR, B.A. (Brit. Col.), M.A. (Oxon.), Ph.D. (Penn.), Assistant
 Professor.
 N. H. THYER, B.Sc. (Birm.), Ph.D. (Wash.), Assistant Professor.
 B. G. TURRELL, M.A., D.Phil. (Oxon.), Assistant Professor.
 G. M. BAILEY, M.Sc. (Melb.), Ph.D. (Austr. N.U.), Instructor.
 W. V. OLSON, B.Sc. (Brit. Col.), Instructor.
 C. F. VON MEYENFELDT, B.Sc. (Brit. Col.), Instructor.

J. H. WILLIAMSON, M.A., Ph.D. (Cambridge), Instructor.
 H. F. BATHO, B.A. (McMaster), S.M., Ph.D. (Chicago), Honorary Lecturer.
 R. J. CLARK, B.A. (McGill), Ph.D. (Cantab.), Honorary Lecturer.
 D. H. PHELPS, B.A. (Reed), M.A. (Dartmouth), Lecturer.
 D. A. AXEN, B.A.Sc., Ph.D. (Brit. Col.), Post-Doctoral Fellow.
 B. L. JONES, Ph.D. (Oregon), Post-Doctoral Fellow.
 W. SEKA, B.A. (Graz), Ph.D. (Texas), N.R.C. Post-Doctoral Fellow.
 J. LEES, Senior Instructor.

Lecturers from the Department of Geophysics

R. DONCASTER RUSSELL, Professor.
 W. F. SLAWSON, Associate Professor.
 R. M. ELLIS, Assistant Professor.
 T. J. ULRYCH, Assistant Professor.

Department of Zoology

W. S. HOAR, B.A. (New Brunswick), M.A. (Western Ontario), Ph.D. (Boston), D.Sc. (New Brunswick), F.R.S.C., Professor and Head of the Department.
 IAN McTAGGART COWAN, B.A. (Brit. Col.), Ph.D. (Calif.), F.R.S.C., Professor and Dean of the Faculty of Graduate Studies.
 JAMES R. ADAMS, M.Sc., Ph.D. (McGill), Professor.
 DENNIS H. CHITTY, B.A. (Toronto), M.A., D.Phil. (Oxon.), Professor.
 N. J. WILIMOVSKY, B.S., M.A. (Mich.), Ph.D. (Stanford), Professor, Director, Institute of Fisheries.
 CYRIL V. FINNEGAN, B.A. (Bates), M.S., Ph.D. (Notre Dame), Professor.
 BRIAN McK. BARY, M.Sc. (New Zealand), Ph.D. (New Zealand), Professor of Biological Oceanography.
 PAUL A. DEHNEL, M.A., Ph.D. (Calif.), Professor.
 KENNETH GRAHAM, B.A. (Brit. Col.), M.Sc. (McGill), Ph.D. (Toronto), Honorary Professor of Forest Entomology.
 PETER FORD, B.Sc., Ph.D. (London), F.Z.S., F.L.S., Associate Professor.
 MIKLOS D. F. UDVARDY, Ph.D. (Debrecen, Hungary), Associate Professor.
 JAMES F. BENDELL, B.A. (Toronto), Ph.D. (Brit. Col.), Associate Professor.
 CASIMIR C. LINDSEY, B.A. (Toronto), M.A. (Brit. Col.), Ph.D. (Cantab.), Associate Professor and Curator of Fishes.
 H. D. FISHER, B.A., M.A. (Brit. Col.), Ph.D. (McGill), Associate Professor.
 GEOFFREY G. E. SCUDDER, B.Sc. (Wales), D.Phil. (Oxon.), F.R.E.S., Associate Professor.
 A. B. ACTON, M.A., D.Phil. (Oxon.), Associate Professor.
 IAN EFFORD, B.Sc. (London), D.Phil. (Oxon.), Associate Professor.
 A. M. PERKS, M.A. (Cantab.), Ph.D. (St. Andrews), Associate Professor.
 D. SUZUKI, B.A. (Amherst), Ph.D. (Chicago), Associate Professor.
 J. MARY TAYLOR, B.A. (Smith), M.A., Ph.D. (Calif.), Associate Professor.
 MICHAEL SMITH, B.Sc. (Manchester), Ph.D. (Manchester), Associate Professor, Biochemistry (attached to Zoology).
 D. J. RANDALL, B.Sc., Ph.D. (Southampton), Assistant Professor.
 A. G. LEWIS, B.Sc., M.Sc. (Florida), Ph.D. (Hawaii), Assistant Professor.

- T. G. NORTHCOTE, M.A., Ph.D. (Brit. Col.), Assistant Professor.
 N. R. LILEY, M.A., D.Phil. (Oxon.), Assistant Professor.
 J. E. PHILLIPS, M.Sc. (Dalhousie), Ph.D. (Cantab.), Assistant Professor.
 J. T. MCFADDEN, B.S. (Pittsburg), M.S. (Ohio State), Ph.D. (Penn. State),
 Assistant Professor.
 H. NORDEN, B.S.A., M.A. (Brit. Col.), Ph.D. (Oregon State), Assistant Professor.
 D. W. FRANCIS, B.A. (Harvard), M.Sc., Ph.D. (Wisconsin), Assistant Professor.
 MISS MARY JACKSON, B.A. (Toronto), M.A. (Brit. Col.), Instructor.
 MISS ALINE B. REDLICH, M.A. (Brit. Col.), Instructor.
 G. J. SPENCER, B.S.A. (Toronto), M.S. (Illinois), Professor Emeritus, Special
 Lecturer.
 MRS. G. BETH STEVENSON, M.A. (Brit. Col.), Lecturer.
 MISS R. F. PARKER, B.A. (Brit. Col.), Lecturer.
 G. P. MORRIS, B.Sc. (Brit. Col.), Lecturer.
 MRS. J. DRUEHL, B.Sc. (Brit. Col.), Lecturer.
 MRS. J. L. DOIDGE, B.Sc. (Victoria), Lecturer.
 MRS. A. GARRETT, A.B. (Brown), Lecturer.
 MRS. C. L. PRETO, M.Sc. (Brit. Col.), Lecturer.
 H. L. A. TARR, M.S.A. (Brit. Col.), Ph.D. (McGill), Ph.D. (Cantab.),
 Honorary Lecturer.
 L. WITT, Dip. For. Eng. (Sopron), Curator.
 HILDA CHING, B.Sc., M.Sc. (Oregon State), Ph.D. (Nebraska), Research
 Associate.
 MARYANNE R. HUGHES, B.A. (Harpur College), M.A., Ph.D. (Duke), Re-
 search Associate.
 MRS. L. K. PITERNICK, M.A., Ph.D. (Calif.), Research Associate.
 EVELYN WAI, M.Sc. (Brit. Col.), Research Associate.
 O. HORVATH, B.S.F. (Brit. Col. Sopron), M.F. (Brit. Col.), Research Associate.
 M. OGAWA, B.S. (Saitama), M.S. (Tokyo), D.S. (Tokyo), Post-Doctoral
 Fellow.
 R. A. RYDER, Ph.D. (Colorado), Post-Doctoral Fellow.

THE FACULTY OF SCIENCE

The Faculty of Science offers courses leading to a B.Sc. degree in the following fields: Biochemistry, Biology, Botany, Chemistry, Geology, Geophysics, Mathematics, Microbiology, Physics, Physiology, Zoology. For information concerning the degrees of M.Sc. and Ph.D. see the Faculty of Graduate Studies calendar.

Students may proceed to the B.Sc. degree in one of three programmes:

Honours Programme: This programme involves intensive specialization in a single field or a combination of fields. It offers the normal entry into Graduate School, and requires a high level of academic competence.

Major Programme: This programme involves specialization in a single field. It may lead to graduate study (if sufficiently high standing is obtained), to additional study in the Faculty of Education or to employment in industry or government.

General Programme: This programme is designed for students wishing to obtain a broad education in science. The programme is not recommended for students intending to proceed into graduate work, however, by proper selection of courses and with a sufficiently high standing it is possible to gain admission to graduate studies from this programme. Normally it would be necessary to complete additional course work in a specialized field of study before completion of a graduate programme.

Registration and Admission

1. Registration must be completed during the period September 12-16.
2. After October 1, except in very special circumstances and with the permission of the Dean, no student may change the programme for which he has registered.
3. All changes in registration must be made by the student at the Registrar's Office. A student may not take courses for which he has not registered, and will be considered as having failed in all courses dropped without permission.

Summer Session and Other Credits

1. Although the B.Sc. degree is normally granted on completion of the required units in the winter session, credits obtained in summer session may be combined with those obtained in winter session to complete the required number of units.
2. The maximum credit for summer session work in any one calendar year is 6 units. It is not possible, however, to take two laboratory science courses in the same summer session.
3. The maximum credit for work other than that of the winter and summer sessions is 3 units in each academic year, not exceeding a total of 15 units subsequent to Grade 13 or First Year.
4. No credit will be granted for work done at other universities in the same academic year in which work has been attempted in this University, whether in the summer session, the winter session, or otherwise. Extramural work done at other universities prior to registration at this University may be accepted, if approved by the Dean, but may not exceed 3 units in respect of any one academic year or a maximum of 15 units subsequent to Grade 13.
5. Students in attendance at the University of British Columbia may not register for extension or correspondence work to be taken concurrently.

General Regulations

1. Students who are accepted by transfer from other institutions must complete all further courses at the University of British Columbia. The University will normally not grant a degree for residence of less than two regular winter sessions or the equivalent. All students must complete the Final Year in residence at the University of British Columbia.

2. Subjects credited to one year may not be transferred later to a higher year.

3. No student may take more than 18 units and, without the special permission of the Dean, fewer than 15 units, in each winter session.

4. Students may not receive University credit for courses passed for Secondary School Graduation whether taken among the required credits or as extra subjects. Advanced placement is possible where appropriate, and the student should consult the department concerned.

5. Students are responsible for ensuring that their courses have been chosen in conformity with Calendar regulations. Students normally complete requirements in accordance with regulations in effect when they first registered. Students who have interrupted their studies must consult the Dean as to the further studies required of them.

Examinations

1. Examinations in the winter session are held in December and April. In December they are held in First and Second Year courses, and except where special exemption has been granted by Faculty, in all upper year courses. In April they are held in all courses except those final at Christmas. These examinations are obligatory for all students.

2. Applications for special consideration on account of illness or domestic affliction must be submitted in writing to the Dean as promptly as possible after the close of the examination period.

3. In any science course which involves both laboratory work and written examinations, students will be required to make satisfactory standing in both parts. Results in laboratory work will be announced prior to the final examination, and students who have not obtained a mark of at least 50% will neither be permitted to write the examination nor to receive any credit for the course.

Standing and Credit

1. Candidates taking at least 15 units of work, and obtaining at least 50% in each subject, will be graded as follows: First Class, an average of 80% or over; Second Class, 65 to 80%; Pass, 50 to 65%

2. (a) A student taking 9 or more units in the winter session will receive credit for a course only if, as a result of the final examinations of that session, he passes in courses totalling at least 9 units. A student may be denied a passing mark, however, for unsatisfactory work during the session.

(b) A student taking fewer than 9 units in the winter session will receive credit for a course only if, as a result of the final examinations of that session, he passes in all his courses. A student may be denied a passing mark, however, for unsatisfactory work during the session.

(c) A student in the summer session or in extra-session or correspondence courses will receive credit for each course in which he obtains a

grade of at least 50%. A student may be denied a passing mark, however, for unsatisfactory work during the session.

3. Courses for which credit has not been obtained must be repeated, or permissible substitutes taken, in the next regular session attended. No course may be repeated more than once.

4. Term essays, laboratory reports and examination papers may be refused a passing mark if they are deficient in English; and, in this event, students will be required to pass a special examination in English to be set by the Department of English.

Examination Results

Results of the sessional examinations in April are mailed to students in the graduating classes about the time of Congregation, and to students in the lower years by approximately June 15. Any student who must meet an application date for another institution prior to June 15 should inform the transcript clerk in the Registrar's Office in order that arrangements may be made to meet the dead-line.

Re-reading of Examination Papers

Re-readings, where permitted by the faculty concerned, are governed by the following regulations:

1. Any request for the re-reading of an answer paper, other than for a supplemental examination (in which a request for a re-reading will not be granted), must reach the Registrar within four weeks after the announcement of examination results and must be accompanied by a fee of \$5.00 for each paper which will be refunded only if the mark is raised.

2. Each applicant for a re-reading must state clearly why he believes the content of his paper deserves a mark higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that a paper with less than a passing mark has been read at least a second time before results are announced. For this reason an applicant granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the re-reading may not be available before the end of the supplemental examination period. A re-reading will not be granted where the standing originally assigned is consistent with the student's term work and record in other subjects.

3. Re-readings will not be permitted in more than two papers (6 units) in the work of one academic year, and in one paper (3 units) in a partial course of 9 units or less or in the work of one summer session.

Supplementals

1. (a) In the winter session, a candidate will be granted a supplemental in a subject which he has taken during the session provided (i) he has written the final examination and has obtained a final mark of not less than 40%, and (ii) he has obtained as a result of the final examinations held in April, at least 9 units of credit in that session. In any one session, no candidate will be granted supplementals in more than 3 units.

(b) In the summer session, a candidate will be granted a supplemental in a subject which he has taken during that session provided (i) he has written the final examination and has obtained a final mark of not less than 40%, and (ii) he has obtained 3 units of credit in that session.

(c) In an extra-session or correspondence course, a student will be granted a supplemental in a subject in which he has obtained a final mark of not less than 40%.

2. If a supplemental granted in a course is passed with a grade of at least 50%, credit will be given for the course. In the computation of the overall average in the work of a session or for a degree, the grade in a supplemental, if passed, will be considered as 50%. Similarly the overall average will not be changed if a subject already passed is written for higher standing.

3. In all but the Final Year a candidate who has been granted a supplemental may write it only once. If he fails, he must repeat the course or take a permissible substitute. In the Final Year he may write it twice.

4. Supplemental examinations, covering the work of both the first and second terms, will be held in August in respect of winter session examinations. Supplemental examinations for summer session students will be held in December.

5. If a student, because of exceptional circumstances, is permitted to postpone a supplemental beyond the first regular supplemental examination period, he will be responsible for the content of the course as currently offered. If the course is not offered or has been discontinued, the supplemental privilege will be cancelled. Attention is also drawn to section 3 under "Standing and Credit".

6. Supplemental examinations may be written in August at the following centres: Cranbrook, Dawson Creek, Kamloops, Kitimat, Ocean Falls, Penitcton, Powell River, Prince George, Prince Rupert, Trail, Victoria; and at Whitehorse, Y.T. Other centres outside of British Columbia are restricted to universities or their affiliated colleges.

In unusual circumstances a student working in a remote area may be permitted to write supplemental examinations at a special centre if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications will be considered.

7. The fee for each supplemental examination written at the University is \$7.50; at a regular outside centre, \$10.00; at a special centre, \$20.00. In the event that a candidate does not appear for an examination a refund will be authorized only if, within 10 days after the scheduled examination, the candidate submits to the Registrar an adequate explanation for the failure to write the examination; if such refund is made, it will be \$5.00.

Applications for supplemental examinations in respect of the winter session examinations, accompanied by the necessary fees, must be in the hands of the Registrar by July 8.

Unsatisfactory Standing

1. A student with standing defective in respect of more than 3 units, although he will not be permitted to register in a higher year, may be allowed to continue by registering in the lower year and taking courses in accordance with section 3 under "Standing and Credit".

2. A student required to withdraw from another faculty may be permitted to register only by special permission. A student with unsatisfactory standing from another institution will not be admitted.

3. A student who passes in fewer than six units (two courses) in the first year of University following Grade 12 will not be permitted to re-enrol at

University to repeat the studies of that year. Consideration will be given to re-admitting a student in this category following his satisfactory completion of Grade 13 or its equivalent. A student who passes six units, while not receiving credit in the year, may re-enrol on probation to repeat his studies but during the subsequent session may be required to withdraw at any time for unsatisfactory progress.

4. A student in the First Year who obtains credit for only nine units on a full programme will be re-admitted on probation but during the subsequent session may be required at any time to withdraw for unsatisfactory progress.

5. A student at any level of University study who fails for a second time, whether in repeating a year or in a later year, will be required to withdraw from the University; he may be re-admitted after a period of at least one year if his appeal to Senate is supported by the Committee on Admissions of the Faculty concerned and upheld by Senate.

6. Any student whose academic record, as determined by the tests and examinations of the first term, is unsatisfactory, may be required to discontinue attendance at the University for the remainder of the session.

Transcript of Academic Record

A transcript of a student's academic record will, on request of the student, be mailed *direct* to the institution or agency indicated in the request. An *official transcript* will not be given to a student except in special circumstances when the transcript will be issued in a sealed envelope carrying the inscription "*official transcript only if presented with seal unbroken*". On graduation or withdrawal a student may obtain for his own use a copy of his record marked "unofficial".

Each transcript must include the student's complete record at the University of British Columbia. Since credit earned is determined on the results of the sessional examinations a transcript will not include results of mid-term examinations.

Student records are confidential. Transcripts are issued only at the request of students or appropriate agencies or officials.

No transcript will be issued to or for a student who has not made arrangements satisfactory to the Accountant's Office to meet any outstanding indebtedness.

Granted Honourable Discharge indicates that the student is in no disciplinary difficulty at the time the transcript is issued; the term has no reference to scholastic status.

Application for a transcript should be made at least one week before the document is required.

Fees for transcripts of academic record: first one free-of-charge, except following graduation when the first three are free-of-charge; additional transcripts \$1.00 each, except that when two or more additional copies are ordered at one time the fee shall be \$1.00 for the first and 25 cents for each remaining copy. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received.

Fees*

First Term Fees, \$243 (includes A.M.S. fee of \$29), payable in full at the time of registration. However, students may pay full fees of \$457 at time of registration. Fourth Year students are assessed an additional \$7 to cover graduation fee.

Second Term Fees, \$214, payable in full on or before the first day of lectures in the second term. Students should mail cheques for second term fees to the Accounting office before this date with a note showing name and registration number.

Partial Courses—See General Information bulletin.

*Subject to change without notice.

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than March 15. Special forms for this purpose are provided by the Registrar's office.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who neglect their academic work and assignments may, on the recommendation of the Head of the Department, be excluded by the Dean of the Faculty from the final examinations. Students who are unavoidably absent because of illness or disability should report to their instructors on return to classes.

Students who because of illness are absent from a December or April examination must submit a certificate, obtained from a doctor, to the University Health Service as promptly as possible.

Withdrawal

Any student who after registration decides to withdraw from the University must report to the Registrar's Office. He will be required to obtain clearance from the University, to the satisfaction of the Registrar, before being granted *Honourable Dismissal* or recommended, where applicable, for refund of fees. (See the General Information bulletin.)

The Senate of the University may require a student to withdraw from the University at any time for unsatisfactory conduct, for failure to abide by regulations, for unsatisfactory progress in his programme of studies or training, or for any other reason which is deemed to show that withdrawal is in the interests of the student and/or the University.

COURSES LEADING TO THE DEGREE OF B.Sc.

General Requirements

(a) For graduation in the General and Major programmes at least 60 units, and for Honours at least 66 units, of course work are required.

(b) Of the above 60 or 66 units required for the degree, at least 36 units must be in courses offered by Departments in the Faculty of Science, and of these 36 units at least 15 units must be in courses numbered 300 or higher.

(c) Of the above 60 or 66 units required for the degree, at least 9 units (including English 100) must be in courses offered by the Faculty of Arts.

(d) Only courses offered by the Faculty of Science or the Faculty of Arts may be counted for credit towards a B.Sc. degree, except as specified in the list of "Courses from Other Faculties" (see p. T67), or in individual cases with the permission of the Dean of the Faculty of Science.

(e) Not more than 9 units in courses numbered less than 300 may be counted for credit in the combined Third and Fourth Years of any B.Sc. programme.

The First Year

English 100, Mathematics 120, Chemistry 102 (110 or 101), Physics 120 (110 or 103) and an elective.

Notes:

(1) Certain Major and Honours programmes require that the additional course in the First Year be another course in a Science. Specifically, Biology 101 is required in the First Year for a Major or Honours in the Life Sciences (Biochemistry, Biology, Botany, Microbiology, Physiology and Zoology); and Geology 105 is required for a Major or Honours in Geology or Geophysics. Students of good ability, especially those who wish to satisfy the prerequisites for a Major or Honours in two or more of the Life Sciences and Geological Sciences, are encouraged to take 18 units.

(2) Students intending to do graduate work in the Sciences are reminded that competence in the reading of scientific literature in one or two foreign languages is usually required. For a Major or Honours in Mathematics, one course at the University level in a language other than English, chosen in consultation with the Department, is *required* before the graduating year.

(3) Advanced credit or advanced placement may be granted where appropriate when any or all of these courses are completed by Grade 13 or equivalent.

The Second and Higher Years

(a) Honours Programme

A student must consult with the Department at the beginning of the Second Year and each subsequent year concerning the Honours Programme and the choice of courses. An average standing of at least 65% must be obtained in each year to remain in an Honours Programme. The sequence of courses is listed under each department in the calendar.

(b) Major Programme

Students should select courses in consultation with departmental advisors at the beginning of the Second Year and each subsequent year. The sequence of courses is given under departmental headings in the calendar.

(c) General Programme

A student in the General Programme may select his courses freely after the First Year.

(1) At least one laboratory course is required in one of the following Life Sciences: Biology, Botany, Microbiology or Zoology.

(2) Of the minimum number of units in courses numbered 300 and above required in the Third and Fourth Years, at least 9 units must be taken in one department of the Faculty of Science, at least 3 units in a second, and at least 3 units in a third department of the Faculty.

Students intending to enter the Faculties of Medicine, Dentistry, and Pharmacy should consult the calendars of these Faculties for entrance requirements.

COURSES

The number of units assigned to a course is given in round brackets immediately following the course number. Thus 200 (3) under Chemistry indicates that Chemistry 200 is a three-unit course.

The hours assigned for laboratory, lectures and tutorials in a course are indicated as follows:

2 lectures and 3 hours laboratory per week, both terms.	[2-3; 2-3]
1 lecture and 2 hours laboratory per week, first term.	[1-2; 0-0]
1 lecture and 2 hours laboratory per week, second term.	[0-0; 1-2]
2 lectures, 3 hours laboratory and 2 hours tutorial or discussion per week, both terms.	[2-3-2; 2-3-2]

An asterisk (*) indicates alternate weeks.

Chemistry

The department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information regarding facilities for graduate study see the Graduate Studies calendar.

It is assumed that all students entering courses of the Department have passed Chemistry 11 or 91 or their equivalent; those who have not must consult the department before registering for Chemistry 101, 102 or 110. All students who intend to take Honours or to major in Chemistry must consult the Head of the Department before registration each year.

Requirements for the B.Sc. degree:

(a) *Single Honours*—First Year: Chemistry 102 or 110, Mathematics 120, Physics 110 or 120, English 100 and 3 additional units. Second Year: Chemistry 200, Chemistry 203, Mathematics 220 (or 202), Physics 204 (or 200), 3 units chosen from Mathematics 221, Physics 206 or another approved course; and 3 additional units. Third Year: Chemistry 303, 304, 310, 311, 312; Mathematics 300 or 323 and 3 additional units. Fourth Year: Chemistry 403, 407, 412, 417, 449 and 3 additional units (to be chosen in consultation with the Department). Reading knowledge of French, German or Russian is highly desirable. Students who have taken French in High School should take German or Russian.

(b) *Combined Honours in Chemistry and Biology*—First Year: Chemistry 102 or 110, Mathematics 120, Physics 120 or 110, Biology 101, English 100. Second Year: Chemistry 200 (or 205), Chemistry 203 (or 230), Mathematics 202, one of Botany 302, 303, 304 or 305, or Zoology 202 or 304 or Microbiology 200; and 3 additional units from Arts. Third Year: Chemistry 305, Chemistry 310, Mathematics 300 or 323, Biology 240 and 234; Biology 330; 3 units from Arts. Fourth Year: Physics 420 or Chemistry 407, Chemistry 403 or 409, Chemistry 311 or 312; 6 units from Botany 302, 303, 304, 305, 330, Microbiology 308, Zoology 202, 304; 1 unit elective.

(c) *Combined Honours in Chemistry and Physics*—First Year: As for Honours Chemistry. Second Year: Chemistry 200, 203; Physics 204, 206; Mathematics 220 or 202, and three additional units. Third Year: Chemistry 304, 310, 312; Physics 301, 303, 308; Mathematics 300. Fourth Year: Chemistry 407, 412, 417; Physics 402 (or 452) and 4 additional units; Mathematics 410.

(d) *Combined Honours in Chemistry and Mathematics*—First and Second Years: As for Single Honours. Third and Fourth Years: 15 units in Chemistry chosen in consultation with the Departments concerned.

(e) *Major*—First Year: As for Single Honours. Second Year: Chemistry 200, Chemistry 203, Mathematics 202 (or 220), Physics 200 (or 204), and 3 additional units. Third Year: Chemistry 304, Chemistry 310, Mathematics 300 and 6 additional units (2 of which may be Chemistry 303). Fourth Year: Chemistry 311, 407, 409 (or 403), 417 and 6 additional units.

101. (3) *General Chemistry*.—Fundamental theories, periodic table, descriptive inorganic chemistry, chemical calculations, modern valency con-

cepts, elementary nuclear chemistry. Mathematics 110 or 120 must precede or be taken concurrently. [3-3; 3-3]

102. (3) **General Chemistry.**—Similar to Chemistry 101 but in somewhat more detail. This course is intended for prospective science and engineering students. Mathematics 120 and a First Year Physics course (preferably 120) must precede or be taken concurrently. [3-3; 3-3]

110. (3) **Principles of Chemistry.**—A study of the fundamental principles of Chemistry with particular reference to the nature of solutions, the solid state and the molecular structure of both inorganic and organic substances. This course is intended for prospective Science and Engineering students who have not taken Chemistry 12. Prerequisites: Chemistry 11, Physics 11. Mathematics 120 and a first year Physics course must precede or be taken concurrently. [3-3-1; 3-3-1]

Primarily for Second Year Students

Note: All students who have not taken Chemistry 101 or 102 or 110 at the University of British Columbia are assumed to have read Sienko and Plane, *Chemistry*, 2nd Edition.

200. (3) **Analytical, Inorganic and Physical Chemistry.**—The fundamental principles of analytical, inorganic and physical chemistry. The laboratory course largely consists of experiments designed to illustrate the principles of modern chemistry. Prerequisites: Chemistry 101 or 102 or 110 and Mathematics 120. This course is only for those students intending to take an Honours degree in Science or to major in Chemistry. The permission of the Head of the Department is required before enrolling. [3-4; 3-4]

203. (3) **Organic Chemistry.**—Fundamental principles of the chemistry of aliphatic, aromatic, alicyclic and heterocyclic organic compounds. This course is only for prospective Honours (or major) students in science. Prerequisites: Chemistry 102 (or 101) or 110. Chemistry 200 *must* precede or be taken concurrently. [3-3; 3-3]

205. (3) **Physical-Inorganic and Analytical Chemistry.**—Systematic inorganic chemistry, properties of matter from a molecular standpoint, equilibria in solution, physical chemistry useful in biological, medical, agricultural, and related sciences. This course is not intended for Honours in Science or for majors in Chemistry. Prerequisites: Chemistry 101 or 102 or 110 and Mathematics 110 or 120. Credit will not be given for both Chemistry 200 and 205. [3-4; 3-4]

230. (3) **Organic Chemistry.**—The fundamental principles of modern organic chemistry including a discussion of the main classes of organic compounds. Prerequisite: Chemistry 101, 102 or 110. [3-3; 3-3]

Primarily for Third Year Students

Note: Honours and Major Students taking Chemistry 303, 310, and 311 concurrently are required to take a special laboratory course which deals with experimental methods and techniques based on these three courses.

303. (2) **Theoretical Organic Chemistry.**—Modern theories of organic chemistry. Organic ions and radicals as stable entities and as reactive intermediates. Stereochemical, isotopic and physical methods of elucidating organic reaction mechanisms. Prerequisites: Chemistry 203. [2-0; 2-0]

304. (3) **Physical Chemistry.**—Elementary thermochemistry, thermodynamics, and electrochemistry; elementary quantum theory; atomic spectra; atomic and molecular structure; states of matter; chemical equilibria; chemical kinetics; colloid chemistry. Prerequisites: Chemistry 200 or 205 (or Physics

200) and Mathematics 202 or 220. Mathematics 300 or 323 concurrently is recommended. [3-3;3-3]

305. (3) **Physical Chemistry for Biologists.**—Atomic and molecular structure; elementary thermochemistry, thermodynamics and electrochemistry; states of matter; chemical equilibria; chemical kinetics; colloid science, surface chemistry and physical chemistry of macromolecules. Prerequisites: Chemistry 200 or 205 and Mathematics 202 or 220. Mathematics 300 or 323 concurrently is recommended. [3-3; 3-3]

310. (3) **Inorganic Chemistry.**—A comprehensive treatment of the periodic system of the elements in terms of modern theories of chemical bonding, structure, and reaction mechanisms. The practical work consists of the preparation and characterization of representative inorganic compounds. Prerequisite: Chemistry 200 or 205. [3-4; 3-4]

311. (2) **Modern Analytical Methods.** — An introduction to modern methods of analysis, including optical, electrochemical and radiochemical methods, mass spectrometry, magnetic resonance spectrometry, and chromatography. Prerequisites: Chemistry 200 or 205. [1-4; 1-4]

312. (2) **Structural Chemistry.**—Elementary crystal chemistry. An introduction to molecular structure determinations by the methods of X-ray and neutron diffraction, electron diffraction, dipole moments, ultra-violet and infra-red spectroscopy, and nuclear magnetic resonance spectroscopy. Prerequisite: Chemistry 200 or 205. [2-0; 2-0]

Primarily for Fourth Year Students

403. (3) **Modern Organic Chemistry.**—Chemistry of alkenes, alicyclic and aromatic compounds and carbonyl compounds; natural products; applications of spectroscopy and other physical methods to organic chemistry. Laboratory qualitative organic analysis; modern laboratory techniques. For Honours students in Chemistry or in Chemistry combined with another subject. Prerequisites: At least Second Class standing in each of Chemistry 200, 203, and 303. [3-4; 3-4]

407. (3) **Advanced Physical Chemistry.**—Chemical thermodynamics; electrochemistry; elementary statistical mechanics, atomic and molecular structure; chemical kinetics; catalysis; surface phenomena; colloids; photochemistry. Prerequisites: Chemistry 304 or 305; Mathematics 300 or 323. [3-4; 3-4]

409. (3) **Advanced Organic Chemistry.**—Synthetic methods, alicyclic and heterocyclic chemistry, natural products. Laboratory work: qualitative organic analysis and techniques of organic synthesis. Prerequisite: Chemistry 230 (or 203). [3-3; 3-3]

412. (2) **Physical Inorganic Chemistry.**—Modern theories of valency. Chemical properties of elements and their compounds from the point of view of simple atomic and molecular structure. Prerequisites: Chemistry 304 and 310. [2-0; 2-0]

417. (1) **Isotope Chemistry.**—Nuclear structure and nuclear reactions. Separation of isotopes, measurement of radioactivity and applications of isotopes to chemical problems. [1-0; 1-0]

449. (3) **Thesis.**—All Honours students are required to undertake original research work on a problem of current chemical interest under the direction of a Staff member. Major students who have satisfactory academic standing may be permitted to enrol in this course after receiving the permission of the Head of the Department.

Graduate Courses

500. (3) **Introduction to Research Methods.**—This course must be taken by all beginning graduate students in Chemistry who, in the opinion of the Department, may not have had a sufficient introduction to the modern techniques currently used in research in the Department of Chemistry.

501. (2) **Topics in Physical Chemistry.**—A discussion of some aspects of modern physical chemistry. The subject matter varies each year and is chosen to be suitable for *all* graduate students in Chemistry.

503. (1) **Seminar in Special Topic.**—A seminar course dealing with recent developments in the students special field of Chemical Science.

504. (1) **Seminar in Chemistry.**—This course is compulsory for *all* graduate students in Chemistry.

505. (1) **Quantum Chemistry.**—Application of quantum mechanics to chemistry. Group theory and molecular symmetry.

506. (1) **Advanced Theoretical Chemistry.**—An advanced course in which will be discussed more recent applications of wave mechanics and statistical mechanics in chemistry.

507. (1) **Transport Properties of Gases.**—Fundamental aspects of the transport properties of gases: Boltzmann Equation, Chapman-Enskog method of solution, transport coefficients, recent developments.

508. (1) **Topics in Chemical Physics.**—Intermolecular forces, relaxation processes in chemistry, electron impact phenomena, electron spin resonance spectroscopy, nuclear magnetic resonance phenomena, energy exchange in molecular systems, theories of molecular interactions.

512. (1) **Colloid Chemistry.**—Properties of disperse systems, thermodynamics, molecular weight and shape, electrophoresis, viscosity, polyelectrolytes.

513. (1) **Chemical Thermodynamics.**—A study of the principles and applications of classical chemical thermodynamics.

515. (1) **Advanced Electrochemistry.**—Modern measurements of conductance, transport and electromotive force; thermodynamics of solutions; Debye-Huckel interionic attraction theory; electrode processes and polarography.

517. (2) **Topics in Inorganic Chemistry.**—Selected topics of current interest in inorganic research and in applications of inorganic chemistry. The subject matter changes each year, and is suitable for all chemistry graduates.

518. (1) **Advanced Inorganic Chemistry.**—Selected topics of inorganic stereochemistry, considered in relation to bond type and position in the Periodic Table. The chemistry of some of the less familiar elements.

519. (1) **Radiochemistry and Radiation Chemistry.**—An advanced course. Natural and artificial radioactive nuclides, nuclear reactions, trans-uranic elements, tracer techniques and applications.

520. (2) **Spectroscopy and Molecular Structure.**—Physical methods for elucidating molecular structure.

521. (1) **Statistical Mechanics.**—Fundamental principles of classical and quantum statistical mechanics. Selected applications, with particular reference to gases, crystalline solids, and chemical reactions.

522. (1) **Surface Chemistry.**—Theories of the adsorption of gases and the kinetics of heterogeneous reactions. Recent advances in heterogeneous catalysis and the structure of solid surfaces.

523. (1) **Chemical Kinetics.**—Types of reactions, kinetic theory, energy transfer processes, transition state theory, chain reactions, reactions in solution, heterogenous processes, photochemistry.

524. (1) **Chemistry of the Solid State.**—Aspects of the structure of solids and the nature of defects in solids in relation to the mechanism of chemical reactions involving solids.

525. (1) **Crystal Structures.**—Crystal structures and structural analysis by the methods of X-ray diffraction, neutron diffraction, and nuclear magnetic resonance.

526. (1) **Physical Chemistry of High Polymers.**—Nature and kinetics of vinyl and condensation polymerization; molecular weight determination; distribution of molecular weights; introduction to kinetic theory of rubber elasticity; physical properties of polymers in the solid state and in solution.

528. (1) **Inorganic Reaction Mechanisms.**—Substitution reactions of inorganic complexes, electron transfer reactions, free radical reactions, photochemical reactions of metal complexes. Catalytic reactions of metal carbonyls, hydrides, and organometallic complexes. Proton transfer reactions.

529. (1) **The Chemistry of Organometallic Compounds.**—The preparations, properties, and structures of aliphatic and aromatic derivatives of metals and metalloids, and of olefinic, acetylenic, and arene derivatives of the transition metals.

530. (2) **Topics in Organic Chemistry.**—Selected topics of current interest in organic chemistry. The subject matter changes each year and is suitable for all chemistry graduates.

531. (1) **Organic Stereochemistry.**—The determination of absolute configuration of synthetic organic compounds and natural products. Stereoselective syntheses. Conformational analysis and organic reaction mechanisms.

532. (1) **Heterocyclic Compounds.**—Advances in the chemistry of pyrrole, furan, thiophene and their derivatives. Heterocyclic compounds of biological importance.

533. (1) **Carbohydrates.**—Introduction to recent work in the field of carbohydrate chemistry.

535. (1) **Alkaloid Chemistry.**—Recent progress in structural and biosynthetic aspects of the chemistry of the alkaloids.

536. (1) **Isoprenoid Compounds.**—Chemistry and biosynthesis of terpenes, steroids and carotenoids.

537. (1) **Cellulose, Lignin and Related Compounds.**—Analytical, physical and organic chemistry of these plant constituents.

538. (1) **Physical Organic Chemistry.**—Electronic and steric effects, acidity functions, isotope effects, linear free energy relations.

540. (1) **Modern Organic Analysis.**

541. (1) **Organic Reaction Mechanisms.**—Ionic and free radical reaction mechanisms. The formation and stereochemistry of reaction intermediates.

542. (1) **Structure of Newer Natural Products.**—A discussion of recent developments in the chemistry of alkaloids, antibiotics, hormones and other recently discovered natural products.

543. (1) **Recent Synthetic Methods in Organic Chemistry.**—Synthetic methods with particular reference to the use of modern reagents and techniques.

544. (1) **Chemistry of Polysaccharides.**—Structure and properties of the major groups of polysaccharides other than cellulose.

548. **Research Conference.**—Attendance is required in each year of registration for the M.Sc. or Ph.D. in chemistry. No unit value.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Geology

The department offers opportunities for study leading to doctoral, master's and bachelor's degrees. For information on the Ph.D. and M.Sc. degree courses, see the Graduate Studies calendar.

Geology 105 (or 150) is prerequisite to all other courses in Geology. Specialization in Geology is possible through Honours or Majors programmes in the Faculty of Science or through Geological Engineering in the Faculty of Applied Science. An Honours programme in Geophysics and Geology is also available and listed under Geophysics.

Requirements for the B.Sc. degree:

(a) **Honours**—First Year: Mathematics 120; English 100; Chemistry 110 or 102; Physics 110 or 120; Geology 105—(total 15 units). Second Year: Mathematics 200 or 202; Chemistry 205; Biology 101 or the equivalent; Physics 200; Geology 204, 210; non-science elective (3 units)—(total 18 units). Third and Fourth Years: non-science elective (3 units); Geology 303, 306, 317, 401, 407, 408, 410, 412, 449; free elective (min. 7½ units)—(total 33 units).

(b) **Major programme** is identical to the Honours programme except that the student is not required to take Geology 408, 410 and 449.

Notes: Students who have not taken Geology 105 in First Year but who wish to take either the Honours or Major programme will follow a special course sequence worked out in consultation with the Department of Geology only. Geology 105, 204 and 210 may normally be taken in the first two years.

Only the following courses are open to General Course students: Geol. 105, 204, 300, 306, 317, 324 and 412.

Geology students may select some of their elective courses from Geography 212, 306 and 312 (and for graduate students, Geography 512, 513, and 514). Credit will not be given for both Geography 312 and Geology 412.

105. (3) **General Geology.**—Physical and historical geology. Origin and structure of the earth, materials of the earth, diastrophism, erosion, land forms, mineral deposits, history of the earth and the development of life. Mr. Danner and Mr. Sinclair. [3-2; 3-2]

204. (3) **Structural Geology.**—Primary and secondary structures in rocks; practice in solving structural problems. Text: Hills, *Elements of Structural Geology*, Wiley, 1962. Prerequisites: Geology 105 or 150; Geology 300 or 210 concurrently. Mr. Ross. [2-3; 2-3]

210. (3) **Mineralogy.**—A comprehensive treatment of the more important crystal classes. Descriptive and determinative mineralogy. Elementary crystal chemistry. Text: Berry and Mason, *Mineralogy*, Freeman. Prerequisite: Geology 105 or 150. Mr. Thompson. [2-3; 2-3]

300. (1½) **Introduction to Mineralogy.**—Methods of identification of minerals; the common rock forming and ore minerals. Intended for General Course and Education students. Text: Dana, *Manual of Mineralogy*, 17th edition, Wiley. Prerequisite: Geology 105 or 150. Mr. Warren. [2-2; 0-0]

303. (1½) **Optical Mineralogy.**—The theory and use of the polarizing microscope in identifying the non-opaque minerals. Text: Kerr, *Optical Mineralogy*, Wiley. Prerequisite: Geology 105 or 150. Mr. Sinclair. [2-2; 0-0]

306. (3) **Paleontology**.—Invertebrate, vertebrate and plant fossils, their classification, identification and evolutionary development. Text: Moore, Lalicker, Fischer, *Invertebrate Fossils*, McGraw-Hill. Prerequisite: Geology 105 or 150. For students majoring or taking Honours in Zoology or Botany, a reading course in historical geology may be substituted for Geology 105. Mr. Best. [2-2; 2-2]

307. (2) **Petroleum, Natural Gas and Ground Water**.—Origin and occurrence of ground water, petroleum, natural gas and structural materials. Text: Levorsen, *Geology of Petroleum*. Prerequisites: Geology 105 or 150, Mathematics 202 or equivalent. Mr. Mathews and Mr. Murray. [2-0; 2-0]

317. (1½) **Petrology**.—The common rocks and the processes which formed them; determination of hand specimens. Text: Huang, *Petrology*, McGraw-Hill. Prerequisite: Geology 300 or 210 and 204 to precede or accompany. Mr. Sinclair. [0-0; 2-2]

324. (3) **Introductory Geochemistry**.—Chemical constitution of the Earth, distribution of elements, geochemical prospecting. Prerequisites: Geology 105, or 150, Chemistry 200 or 205. Geology 300 or 210, 204 and 317 to precede or accompany. Text: Mason, *Principles of Geochemistry*, Wiley. Dr. Warren, Mr. Delavault. [2-2; 2-2]

401. (3) **Stratigraphy and Sedimentation**.—Principles of stratigraphy, stratigraphic nomenclature, correlation, sedimentary environments, sedimentary rocks, litho and bio facies. Laboratory: field interpretation and correlation; sediment analysis; sedimentary structures, hand specimens and thin section study of sedimentary rocks. Prerequisites: Geology 204, 303, 306 and 317. Mr. Danner. [2-2; 2-2]

407. (3) **Petrology**.—The descriptive and interpretative study of igneous and metamorphic rocks. Text: Williams, Turner and Gilbert, *Petrography*, Freeman. Prerequisites: Geology 303, 210, 317. Mr. McTaggart. [2-3; 2-3]

408. (3) **Mineral Deposits**.—Manner of occurrence, genesis, structure and distribution of the principal metallic and some non-metallic mineral deposits, with type illustrations. Text: Park and MacDiarmid, *Ore Deposits*, 1964, Freeman. Prerequisite: Geology 204; 317 must precede or accompany. Mr. White. [3-0; 3-0]

409. (2) **Mineralography**.—Study and recognition of the opaque minerals by the reflecting microscope; practice in the cutting, grinding, and polishing of ore specimens, and micro-chemical methods of determination. Texts: Schouten, *Determination Tables for Ore Microscopy*, Elsevier; Edwards, *Textures of the Ore Minerals*. Prerequisite: Geology 408 must precede or accompany this course. Mr. Thompson. [1-3; 0-4]

410. (1½) **Field Geology**.—Methods of observing, recording, and correlating geological facts in the field. Prerequisites: Geology 204, 210, and 317. Two hours a week in the second term and three weeks in the field at the close of examinations in the spring of the junior year. Limited to Honours and Engineering students. A fee of \$45 is payable in January. The fee covers room, board, and instruction at the Field School for 3 weeks. Transportation to and from camp and liability insurance are the responsibilities of the students. Students taking this course in their Fourth Year will not graduate at the spring convocation. Mr. White, Mr. Thompson

412. (3) **Geomorphology**.—For advanced students in geography and geology; a study of the processes, principles, and laws of land formation,

types of land forms, and their distribution. Text: Thornbury, *Principles of Geomorphology*, 1954. Prerequisite: Geology 204. Mr. Mathews. [2-2; 2-2]

449. (3) Thesis.—Honours students must submit a graduating thesis on some subject approved by the Department.

Graduate Courses

504. (1) **Advanced Structural Geology.**—A course dealing with major problems of earth structure. Mr. Ross.

505. (3) **Structural Analysis.**—Structural analysis of folded rocks, laboratory and seminar. Mr. Ross.

511. (3) **Geology of North America.**—Evolution of the continent of North America and stratigraphy, structure, and geomorphology of Alaska, Canada, United States, Greenland, Mexico, Caribbean Area, Hawaiian Islands and the eastern Pacific Ocean. Emphasis on the study of geologic features of special interest in these areas including fossil localities and mineral deposits. Mr. Danner. (Given in 1966-67 and alternate years.)

514. (3) **Problems of Stratigraphy.**—Seminar and laboratory. Problems of clastic, nonclastic and volcanic-sedimentary deposition. Stratigraphic paleontology. Emphasis on the stratigraphic associations of the eugeosynclinal or volcanic belts. Given in alternate years starting 1967-68. Mr. Danner and Mr. Murray.

519. (1½) **Seminar in Sedimentology.**—Principles of sedimentation as applied to modern and ancient deposits. Mr. Murray.

520. (1½) **Problems in Sedimentology.**—Directed laboratory study in problems of sedimentology. Prerequisite: Geology 401. Mr. Murray.

521. (3) **Problems in Paleontology.**—Seminar; principles of Paleontology, taxonomy and evolution applied to selected pre-Cenozoic metazoan invertebrate groups; alternates with 531. Prerequisite: Geology 306. Mr. Best. Given in 1966-67.

523. (3) **Advanced Mineralogy.**—Seminar; some of the rarer minerals, particularly those of economic importance. Text: Palache, Berman, Frondel, *Dana's System of Mineralogy*, Vols. 1-3; Deer, Howie, Zussman, *Rock Forming Minerals*, Vol. 1-5, Longmans. Mr. Thompson.

524. (3) **Advanced Geochemistry (Mineral Research).**—Study of approved problems, using advanced techniques. Prerequisite: Geology 324 or equivalent. Mr. Delavault.

525. (3) **Igneous and Metamorphic Petrology.**—Seminar. Prerequisite: Geology 407. Mr. McTaggart.

526. (3) **Mineral Deposits.**—Seminar; character, origin, and structure of mineral deposits, with emphasis on ore deposits. Mr. White.

531. (3) **Advanced Invertebrate Paleontology.**—Alternates with Geology 521. Selected groups of fossils, special problems of paleontology, paleontological techniques. Prerequisites: Geology 306. Mr. Okulich.

541. (3) **Paleobotany.**—Origin and history of plants through the geologic time. The floras of Paleozoic, Mesozoic and Cenozoic eras. Techniques of collecting, preparation and identification of fossil plants and pollen. The use of fossil plants as indicators of geological age and ecology. Prerequisite: Geology 306. (Given in 1967-68 and alternate years.) Mr. Rouse.

545. (1½) **Reading Course.**—Assigned reading dealing with problems of geology. Required of all graduate students.

549. (3-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Geophysics

The department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information on the M.Sc., M.A.Sc. and Ph.D. degree courses, see the Graduate Studies calendar.

Requirements for the B.Sc. degree:

(a) Combined Honours, Geophysics and Geology—First Year: Physics 110 or 120, Mathematics 120, Chemistry 102 (preferably) or 101 or 110, Geology 105, English 100; Second Year: Geology 204, 210, Mathematics 202, Physics 200, NSE (6 units); Third Year: Geology 303, 317, Geophysics 302, Mathematics 300, Physics 300, Chemistry 304; Fourth Year: Geology 307 and either 408 or 401, Geophysics 402 and either 400 or 401, Mathematics 410, Physics 400, plus additional units to total 66 for graduation.

(b) Combined Honours, Geophysics and Physics—First Year: as for Combined Honours, Geophysics and Geology, but Physics 120 should be taken in preference to Physics 110; Second Year: Physics 204, 206, Mathematics 220, 221, NSE (6 units); Third Year: Physics 301, 302, 315, Geophysics 301 or Physics 308, Geophysics 302, Mathematics 323; Fourth Year: Geophysics 401, Geophysics 449 or Physics 409, Mathematics 410, at least 6 units selected from Physics 307, 401, 404, 405, 408 (or 458), plus additional units to total 66 for graduation.

(c) Major—First Year: as for Combined Honours, Geophysics and Geology; Second Year: Geology 204, 300, 317, Mathematics 202, Physics 200, NSE; Third Year: Geophysics 301, Geophysics 302, Mathematics 300, Physics 300, NSE; Fourth Year: Geology 408, Geophysics 400 or 401, Geophysics 402, Physics 400, plus additional units to total 60 for graduation.

200. (3) Astronomy.—Constitution of the planets; Sun, Moon, comets, meteorites; age and origin of the solar system; dynamics of the solar system. Prerequisite: first year Physics course and any second year Mathematics course (which may be taken concurrently). [3-0; 3-0]

300. (2) Physics of the Earth.—Elementary seismology; gravity and figure of the Earth; geomagnetism and aeronomy; geothermometry; tectonophysics and the structure and composition of the Earth. Textbook: Jacobs, Russell and Wilson, *Physics and Geology*. Prerequisite: Mathematics 202 or 220, Physics 200 or equivalent. [2-0; 2-0]

301. (3) Waves.—Ray theory of optics and seismology; interference, diffraction and polarization of sound and light waves. Examples will be directed towards geophysical applications. Prerequisite: Physics 200 or equivalent. (Credit will not be given both for this course and for Physics 308.) [3-2*; 3-2*]

302. (3) Physics of the Earth.—Seismology, gravity and figure of the Earth; geomagnetism; geothermometry and tectonophysics. This course is intended primarily for students enrolled in Geophysics programmes, and quantitative aspects of the material will be developed beyond the level of Geophysics 300. Textbook: Jacobs, Russell and Wilson, *Physics and Geology*. Prerequisites: Physics 200 or equivalent. Mathematics 300 or equivalent (concurrently). [3-2*; 3-2*]

310. (3) Exploring the Universe.—A modern approach to the Earth Sciences and Astronomy without the use of advanced mathematics. This course is open only to students registered in third or fourth year Arts. [3-0; 3-0]

400 (2) Applied Geophysics.—Intended primarily for Geophysics major students and Geology students. Instrumentation, application and limitations

of the gravity, magnetic, seismic, electrical and electromagnetic methods. Prerequisites: Physics 200 or equivalent, Geophysics 402 must be taken concurrently. [2-0; 2-0]

401. (2) **Applied Geophysics.**—Application of potential fields to the interpretation of gravity, magnetic, electrical and electromagnetic measurements; instrumentation; filtering techniques for the reduction of geophysical data. Credit cannot be obtained for both this course and Geophysics 400. Prerequisite: Mathematics 410 or equivalent (may be taken concurrently). Geophysics 402 or 449 must be taken concurrently. [2-0; 2-0]

402. (1) **Applied Geophysics Laboratory.**—Examples of the reduction and interpretation of field data illustrating Geophysics 400 and Geophysics 401. [0-3; 0-3]

403. (1) **Geochronology.**—A description of age determination techniques, and the application of these techniques to geological problems. [2-0; 0-0]

449. (3) **Directed Research and Thesis.**—This course is available only to students enrolled in Honours Geophysics programmes.

Graduate Courses

501. (2) **Advanced Geophysics.**—A detailed discussion of the constitution of the Earth as deduced from seismic, magnetic, gravimetric and thermal studies.

502. (2) **Principles of Earth Science.**—A detailed discussion of geologic evidence bearing on graduate research in the Geophysics Department. Prerequisite: consent of the instructor.

511. (1-2) **Seismology.**—Theory of seismic waves and seismographs; focal mechanism, magnitude and statistics of earthquakes; interpretation of surface wave dispersion curves.

512. (1-2) **Geomagnetism and Aeronomy.**—Transient variations, magnetic storms and ionospheric disturbances.

513. (1-2) **Radioactive and Isotopic Processes in Geophysics.**—Modern methods of geochronology and the application of mass spectrometry to geological studies.

514. (1-2) **Geophysical Analysis.**—A discussion of the analysis and interpretation of geophysical phenomena; analytical treatment, numerical procedures, and application of statistical methods.

515. (1-2) **Cosmology.**—Stellar models, radiometric dating of extraterrestrial events, cosmochemistry and related topics.

520. (1-3) **Directed Studies in Geophysics.**

521. (1) **Modern Aspects of Geophysics.**—A seminar course.

549. (6) **M.Sc. Thesis.**

599. (6) **M.A.Sc. Thesis.**

649. **Ph.D. Thesis.**

LIFE SCIENCES

Programmes leading to the B.Sc. degree are offered by the Departments of Biochemistry, Botany, Microbiology, Physiology, and Zoology. In addition, a cooperative programme in Biology is offered by these departments. A combined honours programme in Biology and Chemistry is also available. Biology 101 (or the equivalent*) must be taken in the First Year and is prerequisite to all courses in Biochemistry, Biology, Botany, Microbiology, Physiology, *A First Year university course in Biology, Botany or Zoology will be considered as equivalent.

and Zoology. Students contemplating a major or honours programme in Biology should consult with the Office of the Dean. Students planning a major or honours programme in Biochemistry, Botany, Microbiology, Physiology, or Zoology should consult with advisers in the appropriate department. By a careful selection of courses in the first three years, premedical and predoctoral students may proceed at the end of the Third Year on an acceptable programme in the Faculty of Science should they elect to complete requirements for the B.Sc. degree.

Students wishing to continue on a graduate programme in the life sciences should consult with the department or departments most appropriate to the field of specialization. In special cases inter-departmental or inter-faculty graduate programmes can be arranged.

Details concerning programmes and courses in Biology and in the Departments of Biochemistry, Botany, Microbiology, Physiology, and Zoology are outlined below.

Biochemistry

The department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information on the M.Sc. and Ph.D. degree programmes, see the Graduate Studies calendar.

Requirements for the B.Sc. degree:

MAJOR			
1st Year		2nd Year	
Biol. 101	(3)	Chem. 205 (or 200)	(3)
Chem. 102 (or 101 or 110)	(3)	Chem. 230 (or 203)	(3)
Math 120	(3)	Math 202	(3)
Physics 120 (or 110 or 103)	(3)	3 units of Arts	(3)
English 100	(3)	3 units of Science*	(3)
	—	It is recommended that students take Microbiology 200 in 2nd or 3rd year.	—
	(15)		(15)
3rd Year		4th Year	
Biochem. 410	(3)	Chem. 409	(3)
3 units of Arts	(3)	12 units of electives chosen	(12)
9 units of Science* chosen in consultation with the Department	(9)		
	—	in consultation with the Department	—
	(15)		(15)

*See page T34.

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1st Year		2nd Year	
Biol. 101	(3)	Chem. 200	(3)
Chem. 102 (or 101)	(3)	Chem. 203	(3)
Math 120	(3)	Math 202	(3)
Physics 120 (or 110 or 103)	(3)	Microbiology 200	(3)
English 100	(3)	3 units of Arts	(3)
		3 units of Science*	(3)
	(15)		(18)
3rd Year		4th Year	
Biochem. 410	(3)	Biochem. 430	(1)
Chem. 303	(2)	Biochem. 449	(3)
Chem. 305	(3)	Chem. 403	(3)
Math 300	(3)	9 units of electives	(9)
3 units of Arts	(3)		
3 units of Science*	(3)		
	(17)		(16)

*Science electives:

Biology 234	(1½)	Chem. 407	(3)	Physiology 310	(3)
Biology 240	(1½)	Physics 420	(3)	Physiology 410	(3)
Biology 330	(3)	Microbiology 402	(3)	Physiology 411	(3)
Biology 400	(1½)	Microbiology 405	(3)	Zoology 302	(3)
Biology 401	(1½)	Microbiology 409	(3)	Zoology 303 or	(3)
(in 1966-67)				304	(3)
Biochem. 500	(1)			Zoology 425	(3)
Biochem. 502	(1)			Zoology 428	(3)
Biochem. 503	(1)				
Biochem. 504	(1)				

410 (3) Principles of Biochemistry.—A lecture and laboratory course dealing with the structure, function and metabolic reactions of proteins, carbohydrates, nucleic acids, lipids, and steroids; enzymology and bioenergetics; biochemical transfer of genetic information and protein synthesis; regulatory mechanisms; control of cellular activity. Prerequisite: Chemistry 203 or 230. [3-3; 3-3]

430. (1) Perspectives in Biochemistry.—A seminar course on the history of biochemistry. Prerequisites: Biochemistry 400 or 410.

449. (3) Thesis.—A laboratory research problem under the direction of a staff member.

Graduate Courses

Biochemistry 410, or the equivalent, is prerequisite to all graduate courses in Biochemistry. Students are advised not to take graduate courses in Biochemistry unless they have obtained at least 65% in Biochemistry 410 or the equivalent.

500. (1) Biochemical Methods.—A study of the principles of modern advanced biochemical techniques and their application to the solution of biochemical problems.

502. (1) **The Biochemical Function of Proteins.**—Modern concepts of the relationship between macromolecular structure and biochemical function. Given 1966-67 and alternate years.

503. (1) **Biochemistry of the Nucleic Acids.**—The chemical, physical and biological properties of nucleotides and nucleic acids; the elucidation of nucleic acid structures and modern concepts of their function and replication in the cell. Given 1966-67 and alternate years.

504. (1) **Biochemistry of Amino Acids and Proteins.**—Metabolism of individual amino acids and modern concepts of the biosynthetic mechanisms leading to the formation of proteins by cellular components. Given 1966-67 and alternate years.

505. (1) **Biochemistry of Carbohydrates.**—The metabolism and function of polysaccharides and the metabolic reactions associated with monosaccharides. Given in 1967-68 and alternate years.

506. (1) **Biochemistry of Lipids.**—Modern concepts of the metabolism and biochemical function of fats, phospholipids and cholesterol. Given 1967-68 and alternate years.

507 (1) **Biochemistry of Steroids and Hormones.**—Modern concepts of the metabolism and biochemical function of the sterols, bile acids, steroid hormones, catecholamines and peptide hormones. Given 1967-68 and alternate years.

530. (1) **Seminar in Biochemistry.**—Attendance is required of all graduate students in Biochemistry. Normally each will present one paper per year on a topic approved by his research advisor or committee or on the results of his research.

548. (1-3) **Directed Studies.**—In special cases, with approval of the Head of the Department, advanced courses may be arranged for graduate students in attendance.

549. (6) **M.Sc. Thesis.**

649. **Ph.D. Thesis.**

Biology

Biology is not treated as a department but as a field of study. Programmes are sponsored and instruction is offered cooperatively by the Departments of Biochemistry, Botany, Microbiology, Physiology and Zoology in courses in the Principles of Biology, Biometrics, Cell Physiology, Cytology, Ecology and Genetics. Students wishing to continue on a graduate programme in Biology should consult with the Life Science department or departments most appropriate to the field of specialization. In special cases inter-departmental graduate programmes can be arranged.

Requirements for the B.Sc. degree:

MAJOR			
First Year		Second Year	
Biol. 101	(3)	Biol. 234	(1½)
Chem. 102 (110 or 101)	(3)	Biol. 240	(1½)
Math. 120	(3)	Chem. 230	(3)
Phys. 120 (110 or 103)	(3)	Math. 202	(3)
Engl. 100	(3)	Microbiol. 200	(3)
		*3 Units from Arts	(3)
	(15)		(15)
Third Year		Fourth Year	
Biochem. 410	(3)	1½-3 Units from:	(1½-3)
Biol. 330	(3)	Biol. 400	
3 Units from:	(3)	Biol. 401	
Bot. 330		1½-3 Units from:	(1½-3)
Chem. 200 (or 205)		Bot. 335	
Microbiol. 308		Zool. 425	
Phys. 220 (or 200)		3 Units from:	(3)
Zool. 302		Biochem. 430	
Zool. 304		Bot. 330	
3 Units from:	(3)	Microbiol. 405	
Bot. 302		Physiol. 410	
Bot. 303		Physiol. 411	
Bot. 304		Zool. 304	
Bot. 305		Zool. 428	
Chem. 200 (or 205)		6-9 units of electives to be	(6-9)
Geol. 306		chosen in consultation with	
Phys. 220 (or 200)		Biology advisers and to be ap-	
Zool. 202		proved by the Dean.	
Zool. 301			
Zool. 410			
Zool. 413			
Zool. 415			
Zool. 416			
*3 Units from Arts	(3)		
	(15)		(15)

*Students planning to proceed to graduate work are advised to elect at least one course in a foreign language.

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First Year		Second Year	
Biol. 101	(3)	Biol. 234	(1½)
Chem. 102 (110 or 101)	(3)	Biol. 240	(1½)
Math. 120	(3)	Chem. 230	(3)
Phys. 120 (110 or 103)	(3)	Math. 202	(3)
Engl. 100	(3)	Microbiol. 200	(3)
		*3 Units from Arts	(3)
	<hr/> (15)		<hr/> (15)
Third Year		Fourth Year	
Biochem. 410	(3)	Biol. 449	(3)
Biol. 330	(3)	1½-3 Units from:	(1½-3)
3 Units from:	(3)	Biol. 400	
Chem. 200		Biol. 401	
Chem. 205		12-13½ Units to be chosen in consultation with	(12-13½)
Phys. 220 (or 200)		Biology advisors and to be approved by the Dean.	
3 Units from:	(3)		
Bot. 330			
Microbiol. 308			
Zool. 302			
Zool. 304			
3 Units from:	(3)		
Bot. 302			
Bot. 303			
Bot. 304			
Bot. 305			
Geol. 306			
Zool. 202			
Zool. 301			
Zool. 410			
Zool. 413			
Zool. 415			
Zool. 416			
*3 Units from Arts	(3)		
	<hr/> (18)		<hr/> (18)

*Students planning to proceed to graduate work are advised to elect at least one course in a foreign language.

COMBINED BIOLOGY AND CHEMISTRY HONOURS

First Year	Second Year
Biol. 101 (3)	Chem. 200 (or 205) (3)
Chem. 102 (or 110) (3)	Chem. 203 (or 230) (3)
Math. 120 (3)	Math. 202 (3)
Phys. 120 (or 110) (3)	3 Units from: (3)
Engl. 100 (3)	Bot. 302
	Bot. 303
	Bot. 304
	Bot. 305
	Microbiol. 200
	Zool. 202
	Zool. 304
	*3 units from Arts (3)
(15)	(15)
Third Year	Fourth Year
Chem. 305 (3)	Chem. 311 (or 312) (2)
Chem. 310 (3)	Chem. 409 (or 403) (3)
Math. 300 (or 323) (3)	Phys. 420 (or Chem. 407) (3)
Biol. 234 (1½)	6 Units from: (6)
Biol. 240 (1½)	Bot. 302
Biol. 330 (3)	Bot. 303
*3 units from Arts (3)	Bot. 304
	Bot. 305
	Bot. 330
	Microbiol. 308
	Zool. 202
	Zool. 304
	Biol. 449 (or Chem. 449) (3)
	1 unit elective (1)
(18)	(18)

*Students planning to proceed to graduate work are advised to elect at least one course in a foreign language.

101. (3) Principles of Biology.—An introductory course emphasizing principles of wide application to all living organisms, including cell structure and function, the mechanism of inheritance, evolution, and adaptation to environment. A comparative approach to the unity and diversity of organisms will be stressed. A one hour tutorial is required each week for those students who have not previously had Biology 11 or its equivalent in high school.

[3-3; 3-3]

234. (1½) Fundamental Genetics.—An introduction to the basic principles of heredity, with emphasis on the physical and chemical structure and function of genetic material. Mr. Suzuki.

[3-2; 0-0]

240. (1½) Principles of Cytology.—General descriptive study of the cell and its components. Relation of structure to function. Mitosis, meiosis, and reproduction. Mr. Bisalputra.

[0-0; 2-4]

321. (1½) Principles of Ecology - I.—A study of organisms and their environment, with emphasis on plants. This course complements Biology 322 and normally should be taken in the same session. Mr. Schofield. [3-0; 0-0]

322. (1½) Principles of Ecology - II.—Population and community ecology, with emphasis on animals. This course complements Biology 321 and normally should be taken in the same session. Mr. Efford. [0-0; 3-0]

330. (3) Cell Physiology.—The physico-chemical basis for cellular activity, with particular emphasis on: energy relationships, functions of cell parts, integration and internal control of cellular activities, mechanisms of influence of external factors, and cell ontogeny. The laboratory work will emphasize the techniques and apparatus used to study cell function. Primarily for students in the life sciences but open to others with permission of the instructors. Prerequisite: Chemistry 230. Mr. Phillips and Mr. Tregunna.

400. (1½) Biometrics. - I.—Introduction to statistical procedures applied to biological research. Prerequisites: Math 120 or the equivalent. Mr. McFadden. [3-0; 0-0]

401. (1½) Biometrics - II.—Advanced statistical techniques. Prerequisite: Biology 400. Mr. McFadden. [0-0; 3-0]

449. (3) Directed Biological Research.—A course designed to allow students to undertake a research project in selected fields prior to research at the graduate level. Open only to majors and honours students in biology, and with permission of the appropriate supervisor.

Graduate Programme

The field of biology is not treated by a single department, but instruction is offered cooperatively by the Departments of Biochemistry, Botany, Microbiology, Physiology and Zoology. Students wishing to pursue a graduate programme in biology should consult with the Department or Departments most appropriate to the field of specialization concerning graduate courses.

Botany

Honours and Major programmes are available in Botany. The prescribed courses and electives are given below for each year. Students are strongly advised to choose on or two foreign languages for their non-science electives in Second and Third Years. Department advisors should be consulted before the beginning of the Second Year to assist in the choice of both Science and non-science electives.

The Department offers opportunities for study leading to doctoral, master's and bachelor's degrees. For information on the Ph.D. and M.Sc. degree courses, see the Graduate Studies calendar.

Requirements for the B.Sc. degree:

MAJOR	
First Year	Second Year
Biology 101 (3) Physics 103 (110 or 120) (3) Chemistry 102 (or 110) (3) Mathematics 120 (3) English 100 (3)	6 units from Botany 302 } Botany 303 } (6) Botany 304 } Botany 305 } Chemistry 230 (3) Mathematics 205 (or Plant Science 321-322 or Biology 400-401) (3) 3 units elective* (3)
(15)	(15)
Third Year	Fourth Year
6 units from Botany 302 } Botany 303 } (6) Botany 304 } Botany 305 } Biology 234 (1½) Botany 335 (1½) 6 units elective* (6)	Biology 240 (1½) Botany 425 (3) Botany 330 (3) 1½ units Science elective (1½) 6 units elective* (6)
(15)	(15)

*See N.B. on p. T41.

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First Year		Second Year	
Biology 101	(3)	6 units from:	
Physics 103 (110 or 120)	(3)	Botany 302	} (6)
Chemistry 102 (or 110)	(3)	Botany 303	
Mathematics 120	(3)	Botany 304	
English 100	(3)	Botany 305	
	(15)	Chemistry 230	(3)
		Mathematics 205 (or Plant Science 321-322 or Biology 400-401)	
		3 units elective*	(3)
	(15)		(15)
Third Year		Fourth Year	
6 units from:		Botany 425	(3)
Botany 302	} (6)	Botany 402	(1½)
Botany 303		Biology 240	(1½)
Botany 304		6 units science elective	
Botany 305		(chosen in consultation with the Department)	(6)
Botany 330		(1½)	6 units elective*	(6)
Biology 234	(1½)		
Botany 335	(3)		
6 units elective*	(6)		
	(18)		(18)

N.B. Those planning on teaching careers in Secondary School are advised to take courses in Zoology as their electives. *Of the electives, a minimum of 6 units must be from Arts; students planning to proceed to graduate work are advised to elect at least one course in a foreign language.

302. (3) Morphology & Taxonomy of Seed Plants.—The principles and practices of seed-plant taxonomy emphasizing the use of morphological and evolutionary features in classification and identification. Miss Beamish.

[2-4; 2-4]

303. (3) Biology of Microorganisms. — Morphology, reproduction, and classification of fungi and other heterotrophic plants including bacteria and viruses. Mr. Bandoni.

[2-3; 2-3]

304. (3) Morphology & Taxonomy of Bryophytes and Lower Vascular Plants.—A study of the main taxa emphasizing form, structure, reproduction and phylogeny. Mr. Schofield and Mr. Taylor.

[2-2; 2-2]

305. (3) Biology of Algae.—A systematic survey of the algae, considering their morphology, physiology, and ecology. Miss Stein.

[2-2; 2-2]

330. (3) Plant Physiology.—Introduction to physiological processes in plants, including photosynthesis, transpiration, absorption, enzyme and hormone action, and growth. Chemistry 230 is recommended but not required. Mr. Wort.

[3-2; 3-2]

335. (1½) Plant Genetics.—The evolution of basic concepts in plant genetics including discussion of recent developments and methods. Prerequisites: Biology 234. Miss Cole.

[0-0; 2-3]

402. (1½) **Plant Anatomy.**—Internal structure and organization of vascular plants. Mr. Kuijt. [2-4; 0-0]

420. (3) **Principles of Biogeography.**—Distribution of terrestrial and marine biotas in space and time; similarities and differences; theories of origins of biotas; descriptive biogeography of land and sea. Prerequisite: Biology 321 and 322 or equivalent. Mr. Pillsbury. [2-3; 2-3]

425. (3) **Plant Ecology.**—An introduction to relationships between plants and their environment. Mr. Krajina. [2-3; 2-3]

435. (3) **Plant Biochemistry.**—A comparative survey of intermediary metabolism, including the chemistry, biosynthesis, and distribution of organic compounds in the plant kingdom. Prerequisite: Chemistry 230. Mr. Towers. [2-3; 2-3]

436. (2) **Fundamentals of Cytogenetics.**—A detailed consideration of the nucleus and chromosomes as the physical basis for heredity. Prerequisite: Biology 234 or equivalent. Miss Cole. [0-0; 2-4]

440. (3) **Palaeobotany and Palynology.**—A study of plant macrofossils and microfossils emphasizing phylogenetic relationships of major taxa. (Given in 1966-67 and alternate years.) Mr. Rouse. [2-4; 2-4]

449. (3) **Botanical Research.**—A course designed to allow students to undertake a research project in selected fields prior to research at the graduate level. Open only to majors and honours students in botany, and with permission of the appropriate supervisor.

Graduate Courses

Note: Students wishing to enrol in any of the following courses should consult the instructor in charge for permission, prior to registration.

500. (1) **Field Botany.**—A course designed for students proceeding to a graduate degree in Botany. Attendance may be required at the discretion of the Department as a prerequisite to the degree. The course will last approximately one week and will be held immediately after the sessional examinations in April. A fee of \$25, payable to the departmental secretary on registration in September, is levied to help defray expenses. Field studies will focus attention on the ecology, taxonomy and life histories of representative plant groups. Written reports will be required as directed.

504. (3) **Taxonomy of Vascular Plants.**—Before registration in this course students are required to collect at least 150 species of vascular plants. Part of the laboratory mark for the course is assigned to this collection. Mr. T. M. C. Taylor.

505. (2) **Cytogenetics of Natural Populations.**—Application of cytogenetic principles to the study of evolution and present-day relationships of vascular plants. Miss Beamish.

510. (2) **Marine Phycology.**—Collection, identification, ecology and life histories of algae; emphasis on marine benthonic form. (Given in 1967-68 and alternate years.) Mr. Scagel.

511. (3) **Freshwater Phycology.**—Collection, culture techniques, identification, ecology and life histories of the freshwater forms. (Given in 1966-67 and alternate years.) Miss Stein.

512. (2) **Marine Phytoplankton.**—Collection, identification and quantitative analysis of marine phytoplankton in relation to oceanographic factors. Prerequisite: Oceanography 506. (Given in 1967-68 and alternate years.) Mr. F. J. R. Taylor.

513. (2) **Cytology of Marine Algae.**—A cytomorphological study of marine algae, including a detailed discussion of nuclei and chromosomes. Miss Cole.

515. (3) **Advanced Mycology.**—Taxonomy of fungi; identification, nomenclature, classification. A collection of at least 40 mycological specimens must be made prior to the course. (Given in 1966-67 and alternate years.) Mr. Bandoni.

517. (3) **Marine Mycology.**—Structure, classification, culture, and physiology of marine and brackish water fungi. Special problems on groups or individual species. (Given in 1967-68 and alternate years.) Mr. Hughes.

518. (3) **Advanced Forest Pathology.**—Lectures, laboratory periods and student seminars to cover hereditary, physiological, anatomical, and microbiological factors of trees that influence levels of resistance or susceptibility to disease. Emphasis on critical analyses of host-pathogen relationships of representative microorganisms causing different types of tree disease, including the effects from genetic variation within pathogens. (Given in 1966-67 and alternate years.) Mr. Bier.

520. (3) **Phytogeography.**—Historical and floristic plant geography. The pattern, dynamics and ecology of plant distributions. Terrestrial plants stressed. (Given in 1966-67 and alternate years.) Mr Schofield.

525. (3) **Advanced Plant Autecology.**—(Given in 1966-67 and alternate years.) Mr. Krajina.

526. (3) **Advanced Plant Synecology.**—(Given in 1967-68 and alternate years.) Mr. Krajina.

530. (3) **Advanced Plant Physiology I.**—Studies of the processes and significance of photosynthesis, respiration, and the metabolism of carbohydrates, nitrogen and lipid compounds in plants. (Given in 1967-68 and alternate years.) Mr. Tregunna.

531. (3) **Advanced Plant Physiology II.**—Studies of water relations, mineral nutrition, translocation, growth and development in plants. (Given in 1966-67 and alternate years.) Mr. Wort.

540. **Advanced Paleontology and Palynology.**—Detailed studies of plant macro- and microfossils and phylogenetical and paleoecological interpretations. (Given in 1967-68 and alternate years.) Mr. Rouse.

541. (3) **Structure and Development of Pteridophytes and Gymnosperms.** (Given in 1966-67 and alternate years.) Mr. Kuijt.

542. (3) **Structure and Development of Angiosperms.**—(Given in 1967-68 and alternate years.) Mr. Kuijt.

546. (1-3) **Advanced Topics in Botany.** Staff.

543. (3) **Advanced Cytology.**—Recent advances in the field of cytology will be reviewed. Emphasis will be given to the detailed structure of cytoplasmic organelles and the nucleus in relation to function. (Given in 1967-68 and alternate years.) Mr. Bisalputra.

547. (1) **Seminar on Current Topics.**—Attendance of all students proceeding to graduate degree in Biology and Botany is required during each year of residence. Papers will be presented by students, staff and visitors.

549. (3-6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Microbiology

The department offers opportunities for study leading to doctoral, master's and bachelor's degrees. For information on the Ph.D. and M.Sc. degree programmes, see the Graduate Studies calendar.

Requirements for the B.Sc. Degree:

MAJOR	
First Year	Second Year
English 100 (3)	Chemistry 230 (3)
Biology 101 (3)	Microbiology 200 (3)
Mathematics 120 (3)	Biology 234 (1½)
Physics 120 (110 or 103) (3)	Biology 240 (1½)
Chemistry 110 (102 or 101) (3)	Science (elec.) (3)
	Arts (elec.)* (3)
(15)	(15)
Third Year	Fourth Year
Biochemistry 410 (3)	Microbiology (405) (3)
Microbiology 301 (3)	6 units from: (6)
Microbiology 308 (3)	Microbiology 308
or Microbiology 306	Microbiology 306
plus Microbiology 311	Microbiology 311
Elective (3)	Microbiology 402
Arts (elec.)* (3)	Microbiology 403
	Microbiology 409
	Microbiology 411
	Electives (6)
(15)	(15)

*See page T45.

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First Year	Second Year
English 100 (3)	Chemistry 230 (3)
Biology 101 (3)	Microbiology 200 (3)
Mathematics 120 (3)	Biology 234 (1½)
Physics 120 (110 or 103) (3)	Biology 240 (1½)
Chemistry 110 (102 or 101) (3)	Mathematics 202 (3)
	or Chemistry 205
	Arts (elec.)* (3)
<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> (15)	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> (15)
Third Year	Fourth Year
Biochemistry 410 (3)	Microbiology 405 (3)
Microbiology 301 (3)	Microbiology 430 (3)
Microbiology 308 (3)	Microbiology 449 (3)
or Microbiology 306 plus Microbiology 311 (3)	6 units from: (6)
3 units from:	Microbiology 308
Biology 330	Microbiology 306
Chemistry 205	Microbiology 311
Chemistry 305	Microbiology 402
Chemistry 409	Microbiology 403
Zoology 304	Microbiology 409
3 units from: (3)	Microbiology 411
Botany 303	Elective (3)
Botany 305	
Zoology 420	
Zoology 425	
Arts (elec.)* (3)	
<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> (18)	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/> (18)

*Students planning to proceed to graduate work are advised to elect at least one course in a foreign language.

200. (3) **Introductory Microbiology.**—History of bacteriology; bacteria in nature; classification of bacterial forms; methods of culture and isolation; relation of bacteria to agriculture, industry, veterinary science, public health and sanitation. Prerequisite: Chemistry 110 or 102 or 101 and Biology 101 or equivalent. This course is prerequisite to all other courses in the Department. [3-2; 3-2]

301. (3) **Microbiological Techniques.**—Theoretical principles underlying different methods of sterilization; microbiological procedures associated with the isolation, identification and determination of nutritional requirements of microorganisms; microbiological assays. This course is intended for students seeking a Major or an Honours degree in the Department. [2-4; 2-4]

306. (1½) **Aquatic Microbiology.**—Morphology and physiology of saprophytic and pathogenic marine and freshwater microorganisms. The role of certain species in the economy of nature and in sanitation. [0-0; 2-2]

308. (3) **Microbiology of Food.**—Microbiology of milk, milk products and other foods. An intensive study of the lactic acid bacteria and of yeasts and

molds of significance in the food industries. Role of microorganisms in food spoilage and food preservation. Microorganisms as indices of sanitation and of the acceptability of foods. [2-2; 2-2]

311. (1½) **Soil Microbiology.**—General metabolism, systematics and fundamental techniques used in the study of soil microorganisms. The approach is experimental. Prerequisite: Microbiology 200. (This course is the same as Soil Science 311.) [1-4; 0-0]

402. (3) **Immunology and Immunochemistry.**—Composition and structure of antigens and antibodies; mechanisms of control of antibody synthesis; type reactions of antigens and antibodies; cellular and humoral immunity; allergies and anaphylaxis. This course is required prior to, or must be taken concurrently with Virology 409 or Pathogenic Microbiology 403. Prerequisite: Biochemistry 410. [2-3; 2-3]

403. (3) **Pathogenic Microorganisms.**—Evolution of concepts of contagion and of pathogenic agents; sources, modes of transmission, and methods of detecting, isolating and controlling the commoner human and zoonotic pathogens. The host-parasite relationship; inflammation; gross and microscopic manifestations of certain infections in man and animals. Prerequisite: Microbiology 402 which may be taken concurrently. [4-4; 0-0]

405. (3) **Metabolism of Microorganisms.**—Enzymatic and thermodynamic basis of energy generation and utilization; metabolic pathways unique to microorganisms; genetic and metabolic control mechanisms in cell production. Emphasis is placed on quantitative laboratory skills. [2-3; 2-3]

409. (3) **Virology.**—Bacteriophage, animal and plant viruses. Structure and function of viruses and their components; identification, replication and purification of representative types; biochemical steps in virulent, lysogenic and oncogenic responses in host cells; mechanism of antiviral reactions. Prerequisite: Microbiology 402 which may be taken concurrently. [0-0; 4-4]

411. (1½) **Pathogenic Fungi.**—Morphology, physiology and immunology of fungi with special emphasis on pathogenic species. [0-0; 2-2]

430. (3) **Seminar in Bacteriological Literature.**—Reviews and critical discussions of selected topics. Compulsory for Honours students.

449. (3) **Research Problem.**—In the Final Year of Honours, an investigation approved by Head of Department. The results are presented in a graduating essay, to be reviewed by oral examination.

Graduate Courses

502. (3) **Advanced Immunochemistry.**—Lectures and laboratories on biophysical aspects of protein chemistry and on advanced immunochemical methods. Prerequisite: Microbiology 402 and Chemistry 305.

503. (3) **Bacterial Cytology and Genetics.**—Morphology and functional significance of bacterial cell components. The role of nuclear material in determining inheritable characteristics of bacteria, viruses and fungi. Spontaneous and induced mutations. Transfer of genetic information by processes of transformation, transduction and recombination.

505. (3) **Topics in Intermediary Metabolism.**—A course of lectures dealing with aspects of intermediary metabolism selected from the current biochemical literature. Prerequisite: Microbiology 405. Given in 1967-68 and alternate years.

506. (3) **Laboratory Methods and Procedures.**—The application of quantitative and qualitative biochemical procedures to metabolic studies of micro-

organisms. Credit will not be given for both Microbiology 506 and 507. Prerequisite: Biochemistry 410.

507. (3) **Advanced Laboratory Methods.**—Restricted to graduate students who have had considerable laboratory experience as well as advanced courses in Microbiology and Biochemistry. Credit will not be given for both Microbiology 506 and 507.

530. (3) **Seminar in Microbiology.**

548. (3) **Directed Studies on an approved problem.**

549. (6) **Master's Thesis.**

649. **Ph.D. Thesis.**

Department of Physiology

The department offers opportunities for study leading to doctoral, master's and bachelor's degrees (Honours only). For information on the Ph.D. and M.Sc. degree programmes, see the Faculty of Graduate Studies calendar. For further information on other courses within the department, consult the Faculty of Medicine calendar.

Biology 101, Chemistry 101, 102 or 110 and Physics 110, 120 or 103 or the equivalent are prerequisite to all courses in Physiology.

Biochemistry 410 and Physiology 410, 411, or the equivalents, or consent of the department are prerequisite to all graduate courses in Physiology.

Requirements for the B.Sc. degree:

HONOURS	
First Year	Second Year
Biology 101 (3)	Chemistry 202 (3)
Chemistry 102 (101 or 110) (3)	Chemistry 203 or 230 (3)
English 100 (3)	Mathematics 202 (3)
Mathematics 120 (3)	Zoology 202 (3)
Physics 120 (110 or 103) (3)	Arts elective (3)
	Optional additional (3)
	elective from:
	Biology 234, 240
	Microbiology 200
	Physics 200
(15)	(15-18)
Third Year	Fourth Year
Biochemistry 410 (3)	Physiology 410 (3)
Physiology 310 (3)	Physiology 411 (3)
Arts elective (3)	Physiology 440 (1)
1 elective from list below (3)	Physiology 449 (3)
1-2 optional electives (3-6)	1 elective from list below (3)
	1-2 optional electives (3-5)
(15-18)	(15-18)

List of electives acceptable for the Honours Programme in Physiology:

(At least two courses must be taken from this list.)

Biology 234, 240 (Fundamental Genetics, Principles of Cytology)

Biology 400, 401 (Biometrics I and II)

Botany 435 (Plant Biochemistry)

*Chemistry 305 (Physical Chemistry)

Computer Science 200, 201 (Introduction to Computers. Automatic Programming)

Microbiology 402 (Immunology and Immunochemistry)

Microbiology 405 (Metabolism of Microorganisms)

Physics 420 (Biophysics)

Zoology 301 (Invertebrates)

Zoology 302 (Microanatomy)

*Zoology 428 (Comparative Physiology)

*Electives normally taken.

310. (3) General Physiology.—Fundamental properties of living matter which may be described by physicochemical laws. It is strongly recommended that Chemistry 305 be taken concurrently. Prerequisite: Mathematics 202. Textbooks: Davson, *Textbook of General Physiology*; Giese, *Cellular Physiology*. [2-3; 2-3]

410. (3) Advanced Mammalian Physiology.—A lecture course on body function with particular reference to mammalian and human physiology. [3-0; 3-0]

411. (3) Advanced Mammalian Physiology Laboratory.—A laboratory course designed to illustrate physiological principles and to impart some training in physiological techniques. Normally taken in conjunction with Physiology 410. Enrollment is limited and subject to the consent of the Department. [1-6; 1-6]

440. (1) Seminar.—Open to Honours students in physiology and graduate students. [1-0; 1-0]

448. (1-3) Directed Studies in Physiology.

449. (3) Graduating Essay.—Prior to graduation, students in the Honours course will be required to carry out an investigation approved by the Head of the Department and to submit a satisfactory graduating essay based on this work.

Graduate Courses

Physiology 410, Biochemistry 410, or the equivalent, or consent of the Department, are prerequisite to all graduate courses.

510. (3) Neurophysiology.—A study of the functions of the central nervous system, with special emphasis on mechanisms of synaptic transmission and of information processing. Anatomy 510 must be taken concurrently. [2-3; 3-0]

511. (1-3) Seminar in Mammalian Physiology.—Seminar in selected topics in mammalian physiology.

549. (6) M.Sc. Thesis.

649. Ph.D. Thesis.

Zoology

The department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information on the Ph.D. and M.Sc. degree programmes, see the Graduate Studies calendar.

Requirements for the B.Sc. Degree:

First Year Honours and Major

The programme is identical with the first year Biology programme (page T37).

MAJOR			
Second Year	Third Year	Fourth Year	
Arts option (3)	Arts option (3)	As advised, but to include 6 units of Science of which 3 must be Zoology*	
Zoology 202 (3)	Zoology 301 (3)		
Chemistry 230 (3)	Zoology 302 (3)		
6 units from: (6)	Zoology 304 (3)		
Botany 302	Biology 234 (1½)		
Botany 303	Biology 322 (1½)		
Botany 304			
Botany 305			
Microbiology 200			
Geology 105			
Mathematics 202			
Option			
(15)	(15)		(15)

HONOURS		
Second Year	Third Year	Fourth Year
Arts option (3)	Arts option (3)	Biology 400 (1½)
Zoology 202 (3)	Zoology 301 (3)	Zoology 449 (3)
Chemistry 230 (3)	Zoology 302 (3)	plus 13½ units to include 12 units of Science of which 6 must be Zoology* (13½)
Mathematics 202 (3)	Zoology 304 (3)	
One of: (3)	Biology 234 (1½)	
Botany 302	Biology 322 (1½)	
Botany 303	Option (3)	
Botany 304		
Botany 305		
Microbiology 200		
Chemistry 200 or 205		
Geology 105		
Physics 220		
(15)	(18)	(18)

*Note: For purposes of these regulations, the following courses are acceptable zoology credits in the major and honours programmes: Biology 234 (Genetics); Biology 321/322 (Ecology); Biology 330 (Cell Physiology) Biology 400/401 (Statistics).

202. (3) **Vertebrate Zoology.**—Comparative anatomy; evolution and phylogeny of vertebrates; dissection of representative forms. Mr. Fisher and Mr. Udvardy. [2-3; 2-3]

301. (3) **Invertebrate Zoology.**—Morphology; taxonomy; life histories of invertebrates with special reference to marine forms. Prerequisite: Zoology 202 or permission of instructor. [2-3; 2-3]

302. (3) **Microanatomy.**—Morphological and physio-chemical organization of the cell, description of the fundamental tissues; introductory embryology with an emphasis on causal principles of development. Mr. Finnegan. [2-3; 2-3]

303. (3) **Vertebrate Physiology.**—Organ physiology for students not taking the Major or Honours B.Sc. programme. Prerequisite: First year Chemistry. Biology 101 or the equivalent of one lecture per week and 3 hours laboratory per week for one semester devoted to the functional anatomy of vertebrate animals. Mr. Randall and Mr. Perks. Students will get credit for one only of Zoology 303 and 304. [2-2; 2-2]

304. (3) **Physiology.**—Restricted to students who have successfully completed the 2nd year requirements of the Major or Honours programme in Biology or Zoology. Mr. Randall and Mr. Perks. Students will get credit for one only of Zoology 303 and 304. [2-3; 2-3]

311. (1½) **Introduction to Entomology.**—A survey of the structure, classification and biology of insects, with an introduction to spiders, mites and ticks. For students not specializing in Entomology. Students will get credit for one only of Zoology 311 and 410. Mr. Scudder. [2-3; 0-0]

400. (3) **Principles and History of Biology.**—Lectures and seminar on scientific methodology, history, and current problems. Mr. Chitty. [3-0; 3-0]

401. (3) **Experimental Ecology.**—Theoretical and experimental analysis of the basic principles in population dynamics, behavioural ecology and community structure and discussions of recent advances. Prerequisite: Consent of the instructor. Mr. Efford. [2-4; 2-4]

402. (1½) **Evolution.**—A critical appraisal of the evidence for evolution; a consideration of the basic principles of natural selection and the nature and origin of species and higher categories. Prerequisites: Third Year major or honours, or permission of the Instructor. Mr. Scudder. [0-0; 3-0]

410. (3) **Entomology.**—Functional morphology, taxonomy, biology and physiology of insects; a detailed consideration of selected aspects. For students specializing in Entomology. Credit will not be given for both Zoology 311 and 410. Mr. Scudder. [2-3; 2-3]

412. (3) **Economic Entomology.**—A course on economic insects and the basic principles of insect control. [2-3; 2-3]

413. (3) **Introductory Parasitology.**—Classification, morphology, life histories of animal parasites affecting domestic and wild animals and man. Mr. Adams. [2-3; 2-3]

414. (2) **Marine Invertebrate Zoology.**—General problems in ecology, morphology and physiology of marine invertebrates. Prerequisites: Zoology 301 or equivalent and consent from the instructor. (1966-67 and alternate years.) Mr. Dehnel. [1-3; 1-3]

415. (3) **Biology of Fishes.**—Classification, identification, life histories and ecology of fishes, with an introduction to the study of their marine and freshwater environments. Mr. Lindsey. [2-3; 2-3]

416. (3) **Biology of the Vertebrates.**—The evolution and major features of the terrestrial vertebrates. The form and function of terrestrial vertebrates as related to their distribution and abundance. The laboratory part of the course includes the classification, life histories, and ecology of terrestrial vertebrates with particular attention to those of British Columbia. Prerequisite: Zoology 202. Miss Taylor. [2-3; 2-3]

417. (3) **Morphogenesis.**—The causal factors and mechanisms involved in the development of animals. Prerequisite: Zoology 302. Mr. Acton, Mr. Finnegan, Mr. Ford, Mr. Francis. [2-3; 2-3]

419. (2) **Histological and Histochemical Technique.**—The theory and practice of histological and histochemical methods. Reference will be made to techniques suitable for use with phase contrast, fluorescence, electron and light microscopes. Mr. Ford. [0-0; 1-4]

420. (3) **Biology of the Protozoa.**—Morphology, physiology and natural habitats of protozoa. Prerequisite: Zoology 302 or Microbiology 200. Mr. Francis. [2-3; 2-3]

421. (3) **Principles of Wildlife Biology and Conservation.**—Biological principles in conservation of economically important birds and mammals. Zoology 416 and Biology 322 prerequisite or concurrent. Mr. Bendell. [2-2; 2-2]

422. (3) **Comparative Ethology.**—An introduction to the field of animal behavior with special emphasis on social behavior. Prerequisites: a full year course in physiology. Mr. Liley. [3-0; 3-0]

423. (3) **Comparative Ethology Laboratory.**—Enrollment limited to ten students. Prerequisite: the completion of or current enrollment in Zoology 422. The course will provide practical training in ethological techniques and the development of an individual project. Mr. Liley. [0-6; 0-6]

425. (3) **Advanced Problems in Genetics.**—A study of advanced problems and concepts in chromosome mechanics, radiation, molecular, microbial, human, developmental and population genetics. Prerequisites: Biology 234 or a course of similar content. Mr. Suzuki. [3-3; 3-3]

428. (3) **Comparative Physiology.**—Organ functions in various phyla with interpretations in terms of ecology and phylogeny. Mr. Hoar. [2-4; 2-4]

448. (1-3) **Directed Studies in Zoology.**

449. (3) **Zoology Tutorial.**—Scientific methods of inquiry, organization of research material, use of literature, rules of nomenclature, preparation of manuscripts and illustrative materials, microscopy. Directed investigation of a descriptive problem requiring a written scientific report of the findings. (For Honours students only.)

For Graduate Students

Facilities are available for advanced study and research in the following areas: Biological Oceanography, Comparative Physiology, Developmental and Cell Biology, Entomology, Ethology, Genetics, Ichthyology and Limnology, Parasitology, Population and Community Ecology, Vertebrate and Invertebrate Zoology and Zoogeography. Attention is also directed to the following applied fields of Zoology and students should consult the appropriate adviser for approval of programmes in these areas.

Entomology

A student may enter the field of entomology through zoology, forestry or agriculture. Facilities include an insectary, a museum collection and an excellent library. Mr. Scudder.

Fisheries

Students desiring training in various fields related to fisheries may obtain instruction by a judicious selection of courses offered in various departments of the University. Courses in oceanography form an important part of the graduate work in fisheries biology. The Institute of Fisheries houses an excellent museum and offers facilities for both marine and freshwater fisheries research. Mr. Wilimovsky.

Wildlife Management

Courses of study permitting a student to enter this field of applied zoology can be obtained either through the B.Sc. degree, the B.S.A. degree or the B.S.F. degree. In each instance the Master's degree is essential and students should not attempt to enter the field unless they can meet the academic requirements for it. Facilities for field studies include the Thacker Research Area at Hope, B.C., with 280 acres of varied terrain. Mr. Cowan, Mr. Bendell.

Graduate Courses

500. **Special Advanced Courses.**—Special advanced courses correlated with the work for the thesis may be arranged for a graduate student upon the approval of the Head of the Department. The credit will not be more than 3 units in any one such course.

502. (3) **Advanced Ecology.**—Practical problems in analysis of animal population statistics and construction of population models, including digital computer techniques. Seminar discussions and directed readings. Mr. Bendell, Mr. Chitty, Mr. Effort, Mr. McFadden and Mr. Wilimovsky.

503. (3) **Comparative Physiology.**—Selected topics in animal physiology. Permission of instructors. Mr. Dehnel, Mr. Phillips, Mr. Randall.

504. (2) **Seminar in Comparative Ethology.**—Current problems in animal behaviour. Prerequisites: Zoology 422 or the consent of the Instructor. Mr. Liley.

505. (3) **Cell Biology.**—Problems and recent advances in the study of mechanisms underlying the structure, function and differentiation of cells. Consent of Instructor required for registration. Mr. Acton, Mr. Finnegan, Mr. Ford and Mr. Suzuki.

506. (1) **Marine Field Course.**—A course designed for candidates for the Ph.D. degree. Attendance is required of all such students for a two week period during their residence at the University. The course will commence immediately following sessional examinations in April. Special attention will be given the marine forms, invertebrates and fishes. Emphasis will be placed upon anatomy, taxonomy, life histories and ecology of benthic and planktonic organisms. (1966-67 and alternate years.)

507. (2) **Zoogeography.**—Factors of distribution. Faunal histories. Faunistic and description zoogeography, distribution of biotic communities. (1966-67 and alternate years.) Mr. Udvardy.

508. (2) **Endocrinology.**—Lectures and directed studies of the endocrinology of vertebrates. Registration by permission of instructor, Mr. Perks.

509. (1½) **Population Genetics.**—An introduction to the genetics of animal populations. Mr. Acton.

510. (1½) **Developmental Genetics.**—Recent advances in the study of mechanisms of the genetic control of development. Mr. Acton, Mr. Finnegan, Mr. Suzuki.

511. (2) **Marine Zooplankton.**—Oceanographic factors in relation to the distributions of marine zooplankton. Prerequisites: Zoology 301 or equivalent, and Oceanography 400. (1966-67 and alternate years.) Mr. Bary.

512. (2) **Marine Invertebrate Zoology.**—Life histories, ecology and systematics of marine invertebrates. (1967-68 and alternate years.) Mr. Dehnel.

513. (3) **Biology of Crustacea.**—Morphology, life histories and general biology of representative crustaceans. Mr. Lewis.

515. (3) **Comparative Invertebrate Embryology.**—A study of morphogenesis and developmental physiology of representatives of the invertebrates with laboratory concentration on the local marine forms. Prerequisite: Zoology 301 or equivalent. (1966-67 and alternate years.) Mr. Finnegan.

516. (3) **Advanced Entomology.**—Lectures and directed studies of advanced entomological problems. Mr. Scudder.

517. (3) **Principles and Problems of Applied Entomology.**—The biological background of research and control of injurious insects; the problems and principles of quantitative evaluation, experimentation and manipulation of insects and their populations in relation to variability, structure, physiology, life cycles and behaviour. Mr. Graham.

519. (3) **Parasitology.**—Seminar discussions of selected topics. Basic problems of parasitism, trends in current research. Laboratory procedures in parasitology; individual projects. Prerequisite: Zoology 413. Mr. Adams.

520. (3) **Limnology.**—Physical, chemical and biological factors of lakes and streams in relation to productivity. Prerequisites: Zoology 301, 415. (1966-67 and alternate years.) Mr. Northcote.

521. (3) **Fisheries Biology and Management.**—Description of world fisheries and discussion of population problems pertinent to commercial and game fishes with review of techniques of management of fish stocks. Prerequisite: Zoology 415. Mr. Wilimovsky.

522. (2) **Limnology Seminar.**—Recent advances in limnology. Prerequisite: Zoology 520, or by permission. (1967-68 and alternate years.) Mr. Northcote.

523. (1) **Fisheries Technology.**—Handling, preparation and preservation of fish. Practical work under the direction of the staff of the Pacific Fisheries Experimental Station in its laboratories. Course is open to students in the Commerce - Fisheries option and in Food Technology. Mr. Tarr.

525. (2) **Problems in Systematics and Evolution.**—Seminar discussions of selected topics. Mr. Lindsay and Mr. Scudder.

526. (1) **Marine Zoogeography.**—A discussion of the factors affecting the distribution of marine organisms and the nature of the various marine zoogeographic regions. (1966-67 and alternate years.) Mr. Lewis.

527. (3) **Theoretical Population Dynamics.**—Discussion of dynamics of exploited fish populations and related theoretical population biology. Emphasis will be placed on mathematical models and their application to population problems. Mr. Wilimovsky.

528. (3) **Ichthyology A.**—A comprehensive survey of the morphology, phylogeny, palaeontology, life histories and literature of primitive fishes, including Cyclostomes, Elasmobranchs, and the soft-rayed Teleosts. Lectures, seminars and laboratory dissection. Prerequisite: Permission of the Instructor. (1967-68 and alternate years.) Mr. Wilimovsky.

529. (3) **Ichthyology B.**—A survey similar in treatment to Zoology 528 but covering primarily the Perciform fishes. Prerequisite: Permission of the Instructor. (1966-67 and alternate years.) Mr. Wilimovsky.

Note: Zoology 528 and 529 may be taken in the reverse order.

531. (2) **Ornithology**.—Phylogeny, morphology and biology of birds; factors affecting their abundance and distribution. Mr. Udvardy.

532. (2) **Mammalogy**.—Phylogeny, morphology, and biology of mammals; factors affecting their abundance and distribution. Mr. Fisher.

533. (2) **Problems in Wildlife Management**. Mr. Cowan.

549. (6) **M.Sc. Thesis**.

649. **Ph.D. Thesis**.

Mathematics

The department offers opportunities for study leading to doctor's, master's and bachelor's degrees. For information on the Ph.D., M.A., and M.Sc. degree courses, see the Graduate Studies calendar. For information on the B.A. degree course, see the Faculty of Arts calendar.

Requirements for the B.Sc. degree:

(a) *General requirements*: See p. T21.

(b) *Language requirement* (for all students taking a major in mathematics, or single honours in mathematics, or honours in mathematics combined with another subject, to be taken prior to entering the graduating year): At least one year at the university level of either French, German, Russian or another language approved by the department.

MAJOR

First Year		Third and Fourth Years	
Engl. 100	(3)	Math. 300	(3)
Math. 120	(3)	Four courses from	(12)
Chem. 101, 102 or 110	(3)	Math. 301	
Phys. 110 or 120	(3)	Math. 302	
Elective	(3)	Math. 305	
	(15)	Math. 306	
		Math. 308	
		Math. 410	
		Math. 412	
		Math. 419	
		or certain honours courses	
		with the consent of the	
		department	
		Electives	(15)
			(30)

HONOURS

First Year	Fourth Year
Engl. 100 (3)	<i>Option I:</i>
Math. 120 (3)	Math. 400 (3)
Chem. 101, 102 or 110 (3)	Math. 401 (3)
Phys. 110 or 120 (3)	Math. 404 (3)
Elective (3)	One of Math. 402, 403 (3)
(15)	405, 406, 407, 409, 413, 414, 415, 418
Second Year	Electives (3)
Math. 220 (3)	(15)
Math. 221 (3)	
Phys. 206 (3)	<i>Option II:</i>
Electives (9)	Math. 402 (3)
(18)	Math. 404 (3)
Third Year	Math. 406 (3)
Math. 320 (3)	One of Math. 400, 401, 403, 405, 407, 409, 413, 414, 415, 418 (3)
Math. 321 (3)	Electives (3)
Math. 322 (3)	(3)
Electives (9)	
(18)	(15)

COMBINED HONOURS IN MATHEMATICS AND PHYSICS

First Year	Third Year
Engl. 100 (3)	Math. 320 (3)
Math. 120 (3)	Math. 321 (3)
Chem. 110 or 102 (3)	Math. 322 (3)
(preferably) or 101	Phys. 301 (2)
Phys. 120 (preferably) (3)	Phys. 302 (2)
or 110	Phys. 307 (2)
Arts elective (3)	Phys. 308 (3)
(15)	(18)
Second Year	Fourth Year
Math. 220 (3)	Math. 402 (3)
Math. 221 (3)	Math. 404 (3)
Phys. 204 (3)	One of Math. 400, 401, 403, 405, 406, 407, 409, 413, 414, 415, 418 (3)
Phys. 206 (3)	Phys. 306 (2)
Chem. 200* (3)	Phys. 415 (3)
Arts elective (3)	Two of Phys. 402, 408, 409 (4)
(18)	(18)

*Recommended, but another 3-unit course may be substituted with the approval of the Physics Department.

COMBINED HONOURS IN MATHEMATICS AND ANOTHER SUBJECT

First three years: as for single honours.

Fourth Year: 9 units of Honours Mathematics courses numbered 400 or higher.

Primarily for First Year Students

Mathematics 91 (Secondary School Programme, British Columbia) or its equivalent is prerequisite to, and may not be taken concurrently with, Mathematics 110 or 120. Credit will be given for only one of Mathematics 110, 120.

110. (3) **Fundamental Mathematics.**—Functions, analytic geometry, exponentials and logarithms, introduction to calculus, statistics and probability. This course will not be accepted as a prerequisite to Mathematics 155, 156, 200, 202, 220, 221, 240.

120. (3) **Fundamental Mathematics.**—Trigonometry, analytic geometry and calculus. This course is prerequisite to Mathematics 155, 156, 200, 202, 220, 221, 240. It is a required course for all students in the Faculty of Science and for all students intending to take Engineering, Architecture or a Major or an Honours Course in mathematics.

Advanced Placement. First-year students of high mathematical ability may apply for advanced placement in a special section of Mathematics 220 which will incorporate the essentials of the usual Mathematics 120 and 220 courses. Students who receive credit for this course will be assumed to have completed the First Year Mathematics requirement of the Faculty of Science. Interested students should write to the Department of Mathematics well in advance of registration and, in any event, before September 1, 1966.

Primarily for Second Year Students

200. (3) **Algebra and Geometry.**—Introduction to matrices, linear equations, linear transformations of the plane, determinants, vectors, complex numbers, elementary theory of equations, mathematical induction. Prerequisite: Mathematics 120. [3-0; 3-0]

201. (3) **Finite Mathematics with Business Applications.**—Sets, probability, vectors and matrices, mathematics of finance, linear programming and related topics. Not for credit in the Faculty of Science. Prerequisite: Mathematics 101 (Grade 13), 110 or 120. [3-0; 3-0]

202. (3) **Calculus.**—Integration with applications, vector analysis, introduction to functions of several variables. (Note: Some knowledge of calculus is required for admission to this course.) Prerequisite: Mathematics 120. [3-0; 3-0]

203. (3) **Elementary Mathematics for Teachers.**—For credit only in the Faculty of Education. [3-0; 3-0]

204. (3) **Principles of Mathematics.**—This course outlines some of the basic concepts of number theory, modern algebra, geometry and topology. It is intended for students in the Faculty of Arts. Not for credit in the Faculty of Science. Enrolment will be limited to 40 students. Prerequisite: Consent of the Instructor. [3-0; 3-0]

205. (3) **Elementary Statistics.**—Descriptive statistics, introduction to probability and sampling, correlation, index numbers, time series, simple analysis of variance. Prerequisite: Mathematics 101 (Grade 13), 110 or 120. [3-2; 3-2]

220. (3) **Differential and Integral Calculus.**—Basic ideas of analysis, integration, the mean value theorem, Taylor's theorem, partial derivatives, mul-

multiple integrals. Prerequisite: At least Second Class standing in Mathematics 120 and full standing in the preceding year. [3-0; 3-0]

221. (3) **Algebra and Geometry.**—Mathematical induction, complex numbers, polynomials, introduction to vectors and matrices, linear equations, determinants, solid geometry. Prerequisite: At least Second Class standing in Mathematics 120 and full standing in the preceding year. [3-0; 3-0]

240. (3) **Calculus for Social Science Students.**—The definite integral, exponential functions, linear differential equations, vectors and matrices, convex polyhedral sets and extreme points, partial derivatives. Prerequisite: Mathematics 120. Not for credit in the Faculty of Science. [3-0; 3-0]

Credit may be obtained for only one of Mathematics 202, 220, 240, and for only one of 200, 221.

Primarily for Third and Fourth Year Major and General Course Students

300. (3) **Calculus II.**—Infinite series, partial differentiation, multiple integration, line and surface integrals, vector fields, introduction to differential equations. Prerequisite: Mathematics 202 or 220. [3-0; 3-0]

301. (3) **Life Contingencies.**—Theory of compound interest, introduction to life contingencies. Prerequisite: Mathematics 300 or 320, 321 or 323 (which may be taken concurrently) or the consent of the Department. [3-0; 3-0]

302. (3) **Introduction to Numerical Analysis.**—Interpolation, numerical differentiation and integration, least squares approximation, solution of non-linear equations, generation of random numbers and simulation, principles of programming and problem planning. Prerequisite: Mathematics 300, 321 or 323 (which may be taken concurrently); Computer Science 201 is recommended. [2-2; 2-2]

303. (3) **Mathematics for Elementary Teachers.**—A survey of elementary mathematics to follow Mathematics 203. For credit only in the Faculty of Education. Prerequisite: At least second class standing in Mathematics 203 or the equivalent. [3-0; 3-0]

305. (3) **Statistics.**—Distribution theory, testing of statistical hypotheses, point and set estimation, parametric and nonparametric problems, elements of decision theory, analysis of variance. Prerequisite: Mathematics 300, 321 or 323 (which may be taken concurrently). [3-0; 3-0]

306. (3) **Topics in Geometry.**—A study of various geometries with some attention to the foundations of the subject. Prerequisite: Mathematics 200. [3-0; 3-0]

308. (3) **Topics in Algebra.**—Elementary set theory, introduction to groups and rings, congruences and the number systems. Prerequisite: Mathematics 200. [3-0; 3-0]

410. (3) **Differential Equations.**—An introductory course with applications to geometry, mechanics, physics, and chemistry. Prerequisite: Mathematics 300. [3-0; 3-0]

412. (3) **Fundamentals of Analysis.**—Set theory up to the Cantor-Bernstein equivalence theorem. Real numbers. Continuous-function theorems. Mean-value theorem. Brouwer fixed-point theorem. Poincaré's theorem on vector fields on the surface of a sphere. Prerequisite: Mathematics 300. [3-0; 3-0]

419. (3) **Design of Experiments.**—Design of experiments, the general linear hypothesis, regression theory, construction and analysis of experi-

mental designs, classificatory problems. Prerequisites: Mathematics 300 and 305. [3-0; 3-0]

For Third and Fourth Year Honours Students

At least Second Class standing in each of Mathematics 220 and 221 is prerequisite to Mathematics 320, 321, 322, 323.

320. (3) **Elementary Real-Variable Theory.**—Point sets, continuity, Stieltjes integrals, series of functions, implicit-function theorems. Problem sets will be assigned periodically throughout the year and marks obtained will be considered in determining final standing. [2-1; 2-1]

321. (3) **Advanced Calculus.**—Partial differentiation, integrals over manifolds, special functions, ordinary differential equations. [3-0; 3-0]

322. (3) **Vector Spaces and the Theory of Matrices.** [3-0; 3-0]

323. (3) **Advanced Calculus for Science Students.**—Functions of several variables; infinite series; elementary differential equations. Credit may be obtained for only one of Mathematics 321, 323. [3-0; 3-0]

For Honours students in Mathematics or in Mathematics combined with another subject, at least Second Class standing in each of Mathematics 320, 321, and 322 is prerequisite to each of the following courses. Other students may be admitted only with the consent of the Department.

400. (3) **Algebra I.**—The theory of groups, rings, and fields. [3-0; 3-0]

401. (3) **Analysis.**—Metric spaces (including such examples as l^p , $C(X)$, Hilbert space); Lebesgue integration; differentiation; L^p -spaces. [3-0; 3-0]

402. (3) **Differential Equations.**—Theory of ordinary differential equations and systems; introduction to partial differential equations and boundary value problems. [3-0; 3-0]

403. (3) **Modern Geometry.**—Application of analysis and algebra to topics in modern geometry. (May not be given in 1966-67.) [3-0; 3-0]

404. (3) **Functions of a Complex Variable.**—An introduction to the subject with applications. [3-0; 3-0]

405. (3) **Mathematical Statistics.**—Derivation of sampling distributions, principles of statistical inference and estimation, parametric and non-parametric problems, introduction to regression and the analysis of variance, applications to problems in the sciences. [3-0; 3-0]

406. (3) **Numerical Analysis I.**—Interpolation and elementary approximation theory; numerical solution of differential equations; solution of systems of linear algebraic equations; matrix inversion; calculation of eigenvalues and eigenvectors. [3-0; 3-0]

407. (3) **Theory of Numbers.**—Elementary theory; prime-number theory; elementary Diophantine equations; additive number theory; analytic number theory. (May not be given in 1966-67.) [3-0; 3-0]

409. (3) **Topology.**—Elementary properties of topological spaces; introduction to homology theory. (May not be given in 1966-67.) [3-0; 3-0]

413. (3) **Calculus of Variations.**—Variation of functionals and Euler's equations, canonical variables and transformations, applications to mechanical systems, second variation of a functional, field associated with a functional; extension to several variables, optimal regulation, maximum principle. Prerequisites: Mathematics 321 or 323, 322. (May not be given in 1966-67.) [3-0; 3-0]

414. (3) **Nonlinear Differential Equations I.**—Quasilinear differential equations; topology of the phase plane; general theory of stability of motion according to Lyapunov. [3-0; 3-0]

415. (3) **Dynamical Systems I.**—Differential equations of dynamics; transformation theory; gyroscopic systems; motion of a rigid body about a fixed point; the problem of Kovalevskaya; self-excited rigid body. (May not be given in 1966-67.) [3-0;3-0]

418. (3) **Probability.**—Introduction to and application of stochastic processes. Random walks, branching processes, recurrent events, Markov chains, birth and death processes, queuing theory, applications to biology, physics, and economics. Prerequisites: Mathematics 321 or 323, 322. [3-0; 3-0]

Graduate Courses

Students interested in graduate courses should consult the Department.

- 501. (3) **Theory of Functions of a Real Variable.**
- 502. (3) **Point Set Topology.**
- 503. (3) **Differential Geometry.**
- 504. (3) **Modern Geometry II.**
- 505. (3) **Fluid Dynamics.**
- 506. (3) **Differential Equations.**
- 507. (3) **Theory of Numbers and Algebraic Numbers.**
- 508. (3) **Theory of Rings.**
- 509. (3) **Algebra II.**
- 510. (3) **Linear Algebra.**
- 511. (3) **Topology.**
- 512. (3) **Theory of Groups.**
- 513. (3) **Continuous Groups.**
- 514. (3) **Nonlinear Differential Equations II.**
- 515. (3) **Integral Equations.**
- 516. (3) **Fourier Series and Integrals.**
- 517. (3) **Theory of Functions.**
- 518. (3) **Probability.**
- 519. (3) **Statistics.**
- 520. (3) **Numerical Analysis II.**
- 521. (3) **Functional Analysis.**
- 522. (3) **Linear Analysis and Group Representations.**
- 523. (3) **Theory of Games and Programming.**
- 524. (3) **Operational Calculus.**
- 525. (3) **Celestial Mechanics.**
- 526. (3) **Dynamical Systems II.**
- 527. (3) **Theory of Elasticity.**
- 528. (1-3) **Theory of Automata.**
- 529. (1-3) **Information Processing.**
- 530. (1-3) **Topics in Algebra.**
- 531. (1-3) **Topics in Analysis.**
- 532. (1-3) **Topics in Topology.**
- 533. (1-3) **Topics in Geometry.**
- 534. (1-3) **Topics in Theoretical Mechanics.**
- 535. (1-3) **Topics in Differential Equations.**
- 536. (1-3) **Topics in Numerical Analysis.**
- 537. (1-3) **Topics in Probability and Statistics.**
- 538. (1-3) **Topics in the Foundations of Mathematics.**
- 549. (3-6) **Thesis for Master's Degree.**
- 649. **Ph.D. Thesis.**

Computer Science

200. (1½) Introduction to Computers.—An introduction to the logic and the programming of a digital computer. Binary number systems, machine organization, programming fundamentals. Problems from elementary number theory, sorting and data processing. Prerequisite: Mathematics 101 (Grade 13), 110 or 120. [3-1; 0-0]

201. (1½) Automatic Programming.—A complete description of an automatic programming language with applications to various data-processing problems in statistics and accounting, as well as elementary scientific calculations. Prerequisites: Mathematics 101 (Grade 13), 110 or 120. [0-0; 3-1]

300. (3) Advanced Programming and Data Processing.—Searching and sorting records, non-numeric concepts, assembly systems, interpreters and compilers. Prerequisites: Computer Science 200, 201 and Mathematics 200 (or the consent of the Department). [3-1; 3-1]

Physics

The department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information on the M.Sc., M.A.Sc. and Ph.D. degree programmes and courses, see the Graduate Studies calendar.

All students entering second or higher years who intend to major or to take single or combined Honours in Physics must consult the Head of the Department of Physics before registration each year. General course students should consult the Department for advice concerning appropriate courses.

Requirements for the B.Sc. degree:

(a) **Single Honours**—First Year: Physics 120 (preferably) or 110; Mathematics 120; Chemistry 110 or 102 (preferably) or 101; English; NSE^a. Second Year: Physics 204, 206; Mathematics 220, 221; Chemistry 200^b; NSE^a. Third Year: Physics 301, 302, 303, 306, 307, 308; Mathematics 322, 323. Fourth Year: Physics 402, 404, 408, 409, 415; Mathematics 364^c, 402.

(b) **Combined Honours (Physics and Mathematics)**—First and Second Years: as for Honours Physics. Third Year: Physics 301, 302, 307, 308; Mathematics 320, 321, 322. Fourth Year: Physics 306, 415; two of Physics 402, 408, 409; Mathematics 402, 404, plus an additional 3 units in Mathematics to satisfy Mathematics Department.

(c) **Combined Honours (Physics and Geophysics)**—First Year: Physics 120 (preferably) or 110; Mathematics 120; Chemistry 110 or 102 (preferably) or 101; Geology 105; English. Second Year: Physics 204, 206; Mathematics 220, 221; NSE (6 units). Third Year: Physics 301, 302, 315; Geophysics 301 or Physics 308; Geophysics 302; Mathematics 323. Fourth Year: Geophysics 401; Geophysics 449 or Physics 409; Mathematics 410; at least six units selected from Physics 307, 401 or 404, 408 (or 405 and 458), plus necessary additional units to total 66 for graduation.

(d) **Combined Honours (Physics and Chemistry)**—First Year: As for Honours Physics. Second Year: Physics 204, 206; Mathematics 220 or 202; Chemistry 200, 203; NSE. Third Year: Physics 301, 303, 308; Mathematics 323 (preferably) or 300; Chemistry 304, 310, 312. Fourth Year: Physics 402 (or 452) and 5 (or 4) additional units in Physics; Mathematics 410; Chemistry 407, 412, 417.

(e) **Combined Honours (Physics and a subject other than Mathematics, Geophysics or Chemistry)**—Physics and Mathematics courses similar to those in (d) but including Physics 307. The programme should be chosen in consultation with the Heads of the Departments concerned.

(f) Major—First Year: Physics 110; Mathematics 120; Chemistry; English; elective. Second Year: Physics 200; Mathematics 200, 202; 3 additional units of Science; elective. Third Year: Physics 300, 308, 315; Mathematics 300; elective. Fourth Year: Physics 400, 401; one of Physics 302, 306, 409, 419; Mathematics 410; electives.

Code: a. NSE—Non-Science elective. At least one year of a language is recommended, and is required for combined Honours in Physics and Mathematics.

- b. Recommended, but another 3-unit course may be substituted.
- c. M404 may be substituted after consultation with Head of the Physics Department.

Primarily for First Year Students

Mathematics 120 and a First Year course in Physics (with laboratory) are prerequisite to all Second Year courses in Physics. Credit will be given for only one of Physics 120, 110, 103, former 101, or a course at another institution accepted by the Physics Department as equivalent to one of these.

Beginning with 1967-68, Physics 120 with at least second class standing will be the normal prerequisite for the Honours programme in Physics, but students lacking the Physics 12 prerequisite for Physics 120 who obtain first class standing in Physics 110, 103 or equivalent may be admitted to the Honours programme in Physics if their overall academic record is acceptable to the Physics Department.

Physics 110 (or the former 101) will be the normal (and Physics 120 an enriched alternative) prerequisite for the majors programme in Physics and for the Faculty of Applied Science.

Physics 103 is intended mainly for students not planning to specialize in physics, but may be accepted as a prerequisite to Second Year physics courses if the student's overall academic record is deemed satisfactory by the Physics Department. Students from other faculties taking Physics 103 as a terminal course are advised to do so not before their Second Year at the university.

103. (3) **Elements of Physics.**—From Newton's mechanics to particle physics, a description of ideas, principles and their applications. [3-3*; 3-3*]

110. (3) **Mechanics, Electricity and Atomic Structure.**—Prerequisite: Physics 11. Mathematics 120 must precede or be taken concurrently with this course. [3-3*-2*; 3-3*-2*]

120. (3) **Matter and Mechanics.**—The structure and properties of matter, Newtonian mechanics of particles, laboratory investigations emphasizing the use of electrical instruments. Textbook: M.I.T. Science Teaching Center, *Physics, a New Introductory Course*, Parts I and II. Prerequisites: Physics 11 and 12. Mathematics 120 must precede or be taken concurrently with this course. [2-3-1; 2-3-1]

Primarily for Second Year Students

Physics 204 and 206 are intended for prospective Honours students in the physical sciences; approval to register must be obtained from the Departmental representative at the time of registration. Physics 200 is intended for all Physics Major students and for students not intending to specialize in Physics. (If credit is obtained for Physics 200, no additional credit may be obtained for Physics 204 or 206, and vice-versa.) Either Physics 204 and 206, or Physics 200, is prerequisite for all higher year courses in Physics.

200. (3) **Intermediate Physics.**—Statics, dynamics, properties of matter, sound, heat and kinetic theory of gases, photo-electricity and the Bohr atom. Prerequisites: Physics 110 or 120, and Mathematics 202 or 220 (may be taken concurrently). Textbook: Sears and Zemansky, *University Physics*, 3rd ed., Part I. [3-3; 3-3]

204. (3) **Heat and Electricity.**—Heat, gas laws, elements of thermodynamics, kinetic theory. Elements of electricity; charge, current, voltage, resistance, capacitance, inductance, Kirchhoff's laws, potentiometer, motion of a charge in a uniform magnetic field. [3-3; 3-3]

206. (3) **Mechanics.**—Vectors, statics, dynamics, energy, momentum, rotation, rigid body motion, gravitation, harmonic motion, oscillations, properties of fluids, elasticity and wave motion. Textbook: Ingard and Kraushaar, *Introduction to Mechanics, Matter, and Waves*. [3-0-1; 3-0-1]

Primarily for Third and Fourth Year Honours Students

301. (2) **Electricity and Magnetism.**—Experimental basis and mathematical formulation of the laws of Coulomb, Ampere and Faraday and of the concepts of electric and magnetic fields leading up to Maxwell's equations. Use of complex numbers in A.C. theory. Prerequisite: Physics 204. [2-3; 2-0]

302. (2) **Introduction to Mathematical Physics.**—Application of differential equations and vector analysis to topics from free and forced vibrations, wave motion, potential theory, heat conduction. Textbook: Sokolnikoff and Redheffer, *Mathematics of Physics and Modern Engineering*. Prerequisite: Physics 200 or 206. [2-0; 2-0]

303. (1) **Electronics.**—Electronic circuits and their application in physics. Amplification, modulation, detection, feed-back, oscillators, rectification, and pulse circuits. Textbook: Hunten, *Introduction to Electronics for Students of Physics and Engineering Sciences*. [1-0; 1-3]

306. (2) **Theoretical Mechanics.**—Analytical mechanics of particles and rigid bodies. Lagrange and Hamilton equations, Hamilton-Jacobi theory. [2-0; 2-0]

307. (2) **Introduction to Modern Physics.**—Discharge through gases, electrons, thermionic emission, photoelectricity, radioactivity, alpha, beta and gamma rays, Rutherford scattering, nuclear atom, Bohr atomic theory, spectral series, the vector model, Pauli principle and periodic table, spectral terms and electron configurations, Zeeman effect, X-rays, neutrons, isotopes. [2-0; 2-0]

308. (3) **Physical Optics.**—Geometrical and physical optics; optical instruments, interference, diffraction, polarization, spectroscopy. Textbook: Ditchburn, *Light*. [2-3; 2-3]

402. (2) **Modern Physics.**—Wave-particle aspects of radiation and matter, de Broglie waves, Schrödinger equation, hydrogen-like atoms, selection rules, molecular spectra, alpha and beta decay, nuclear reactions, nuclear models, cosmic rays and mesons. [2-0; 2-0]

404. (3) **Mathematical Physics.**—Applications of special functions, partial differential equations and integral equations to physical problems. Separable coordinates. Maxwell's equations. Radiation theory. The Wiener-Hopf method. Green's functions including applications to scattering theory. Perturbation and variation methods. Prerequisites: Mathematics 321 or 323, and Physics 302. [3-0; 3-0]

405. (1) **Elasticity.**—Introductory theory of elasticity with some applications. [2-0; 0-0]

408. (2) **Fluid Flow.**—The equations of motion and their solution for non-viscous and viscous fluids, laminar and turbulent flow, stability, rheology. Text: Eskinazi, *Principles of Fluid Mechanics*. [2-0; 2-0]

409. (2) **Experimental Physics.**—Advanced experiments in electricity, electronics, atomic and nuclear physics. Textbooks: Hoag, *Electron and Nuclear Physics*; Strong, *Procedures in Experimental Physics*; Yarwood, *High Vacuum Technique*. [0-6; 0-6]

415. (3) **Thermodynamics and Statistical Mechanics.**—Laws of thermodynamics and statistical mechanics; applications to modern physics. Prerequisite: Physics 306 (may be taken concurrently). [3-0; 3-0]

Primarily for Third and Fourth Year Major Students

Credit will be given for only one member of each following parallel pair of Majors (Honours) courses: 300 (301); 315 (old 304, or 415); 400 (307); 419 (409).

300. (3) **Electricity and Magnetism.**—Fundamentals of magnetism and electricity, including basic A.C. circuit theory. Textbook: Duckworth, *Electricity and Magnetism*. Prerequisites: Physics 200; Mathematics 202 or 220. [3-3; 3-3]

315. (3) **Thermodynamics and Statistical Theory of Matter.**—Laws of thermodynamics and an introduction to statistical mechanics. [3-0; 3-0]

400. (3) **Atomic and Nuclear Physics.**—The major phenomena in the fields of atomic and nuclear physics. Prerequisite: Physics 300 or 301. [3-0; 3-0]

401. (2) **Electricity and Magnetism.**—Potential theory, Maxwell's equations and electromagnetic waves. Textbook: Reitz and Milford, *Foundations of Electromagnetic Theory*. Prerequisite: Physics 300 or 301. [2-0; 2-0]

419. (2) **Experimental Atomic Physics.**—Experimental investigations in the fields of atomic and nuclear physics forming a course supplementary to Physics 400 which should precede or be taken concurrently with this course. This course is available for credit in the Faculty of Education. [0-8*; 0-8*]

420. (3) **Biophysics.**—An introduction to the methods of biophysics through a study of selected problems of contemporary interest: e.g., kinetics and energetics of the cell, photosynthesis, active transport, nerve and muscle activity, molecular biology, radiation damage. Experimental techniques are of particular interest; some are met in the laboratory. Prerequisites: Mathematics 202; any Physics course numbered 200 or higher, or Chemistry 304. Students without biological background will be given supplementary reading. [2-3; 2-3]

429. (3) **Experimental Atomic Physics.**—Experimental investigations in atomic and nuclear physics together with lectures providing mathematical background. Prerequisite: Physics 300. Physics 400 should precede or be taken concurrently with this course. Available for credit in the Faculty of Education. Credit will not be given for both Physics 419 and 429. (Offered in Summer Session only.) [1-4; 1-4]

430. (3) **Recent Developments in Physics.**—This course is available for credit only in the Faculty of Education. It consists of lectures and demonstrations and is intended to review the latest developments in physics. (Offered in Summer Session only.) [3-0; 3-0]

441. (1) **Introductory Meteorology.**—Instruments. Observations and their presentation. Synoptic patterns. Basic dynamics and thermodynamics of the atmosphere. Water vapour and cloud formation. Radiation. Prerequisites: One of Physics 156, 200, 204 or equivalent; Mathematics 202 or equivalent. [2-0; 0-0]

Primarily for Pre-Architectural and General Course Students

326. (3) **Electricity, Acoustics and Light.**—An intermediate course offered primarily for pre-architecture students. Not available to Physics Honours or major students. Prerequisites: Physics 200; Mathematics 202 or 220. [3-3; 3-3]

Graduate Courses

501. (2) **Elementary Quantum Mechanics.**—Non-relativistic quantum mechanics with application to atomic problems. Prerequisite: one of Physics 400, 402, 452 or equivalent.

502. (2) **Waves.**—Wave propagation in one, two, and three dimensions with consideration of reflection, refraction, diffraction, dispersion, surface coupling, wave guide phenomena, and propagation of waves in inhomogeneous and dissipative media. Principal emphasis will be on electromagnetic and acoustic waves.

503. (1) **Electromagnetic Theory.**—A deductive presentation of the classical theory of electrons and its relation to the macroscopic electromagnetic theory. Prerequisite: Physics 401 or 404.

505. (2) **Nuclear Physics.**—Interactions of radiation with matter, radio-activity, nuclear reactions, nuclear properties. Textbooks: Evans, *The Atomic Nucleus*; Elton, *Introduction to Nuclear Theory*; Preston, *Physics of the Nucleus*.

506. (2) **Quantum Theory of Solids.**—An elementary treatment of the theory of the structure and properties of solids: energy band method, lattice vibrations, phonon and electron transport, dielectric and magnetic properties, imperfections.

507. (2) **Plasma Physics.**—Equilibrium theory of ionized gases, kinetic theory, transport coefficients. Motion of individual charges, cyclotron radiation. Waves, Landau damping. Derivation of magnetohydrodynamic equations.

509. (1) **Theory of Measurements.**—Probability, statistical distributions, significance tests, least squares, experimental design, numerical techniques.

510. (1) **Stochastic Processes in Physics.**—Statistical and thermodynamic fluctuations in electromagnetic, mechanical and thermal systems. Fundamental limits of observation and measurement in classical and quantum systems.

511. (1) **Advanced Magnetism.**—Spin hamiltonian, theory of ferro- and antiferromagnetism, nuclear magnetic resonance, relaxation in spin systems. Prerequisites: Physics 501 and 506.

512. (1) **Spectroscopy.**—Energy states of atoms and diatomic molecules. Textbooks: Herzberg, *Atomic Spectra and Atomic Structure*; Herzberg, *Molecular Spectra and Molecular Structure*. Prerequisite: Physics 501.

513. (1) **Crystal Structure and X-rays.**—Fundamentals of crystallography, production and properties of X-rays, structure analysis by X-rays and electron diffraction.

514. (1) **Special Relativity Theory.**—Relativistic kinematics, dynamics, connection with electromagnetic theory. Prerequisite: Physics 401 or 404.

515. (1) **Physical Electronics.**—Electronic processes in vacuo and in solids with particular reference to electron beams and semiconductors and the physical aspects of the devices derived therefrom.

516. (2) **Statistical Mechanics.**—Ensemble theory (classical and quantum mechanical). Fluctuations. Response to external perturbations. Non-equilibrium statistical mechanics. Prerequisite: Physics 403, 415 or 455.

517. (1) **Introduction to Low Temperature Physics.**—Description of cryogenic techniques insofar as these differ from normal techniques. Phenomenological aspects of low temperature physics.

518. (1) **Low Temperature Physics.**—Theoretical aspects of selected topics of interest in low temperature physics. Students enrolling in this course are expected to have a working knowledge of quantum mechanics.

519. (1) **Molecular Spectroscopy.**—Theory of Raman effect and infra-red absorption. Vibrational spectra of polyatomic molecules. Chemical applications.

520. (2) **Advanced Spectroscopy.**—Selected topics; determination of nuclear properties, microwave spectra. Textbooks: Condon and Shortley, *The Theory of Atomic Spectra*; Herzberg, *Infra Red and Raman Spectra*.

521. (2) **Group Theory Methods in Quantum Mechanics.**—Selected topics from atomic, molecular, solid state, nuclear and elementary particle physics treated by group theory methods. Prerequisite: Physics 501 (may be taken concurrently).

522. (1) **Physics of Nuclear Reactions.**—A course for those interested in reactions produced by high energy neutron and ion beams.

523. (1) **Advanced Electronics.**—Advanced treatment of problems in noise, non-linear circuit theory and information theory.

524. (1) **Waves and Antennas.**—Energy and power flow, wave impedance concept, reflection and refraction; properties of media, dispersion, propagation along the ground and via the ionosphere; antenna radiation, electromagnetic screening; plasma waves.

525. (1) **Advanced Topics In Solid State Physics.**—Theory of the structure and properties of solids, with emphasis on electronic phenomena.

526. (1) **Quantum Theory of Radiation.**—Calculation of cross-sections for absorption, emission and scattering of photons, creation and annihilation of positrons. Theory of radiation damping. Prerequisites: Physics 501, 503 and 514.

527. (1) **Theoretical Nuclear Physics.**—Selected topics from current nuclear theory. Prerequisites: Physics 501 and 505.

528. (1) **Cosmic Rays and High Energy Physics.**—Nuclear and electromagnetic interactions at very high energies. Nature and origin of cosmic rays, mesons, hyperons and anti-particles.

529. (2) **Advanced Quantum Mechanics.**—Selected topics in relativistic quantum mechanics, quantum field theory, and theories of elementary particles. Prerequisites: Physics 501 and 514.

530. (1) **General Relativity Theory.**—Primarily for students interested in theoretical physics. Prerequisites: Physics 503 and 514.

531. (1) **Advanced Plasma Physics.**—Selected topics from current research in plasma physics—seminar course.

532. (2) **Plasma Dynamics.**—The magnetohydrodynamic formulation of plasma dynamics including the effects of diffusion, viscosity, thermal conduction and ionization phenomena on plasma motion.

534. (1) **Radiological Physics I.**—A systematic study of the principles involved in radio-therapy and of the techniques required for the application of these principles.

535. (1) **Radiological Physics II.**—A continuation of Physics 534, including an extension of the topics discussed in that course.

537. (1) **Advanced Dynamic Oceanography.**—A more intensive study of the dynamics of ocean currents. Reference: Stommel, *The Gulf Stream*. Prerequisite: Oceanography 401.

538. (1) **Fluid Mechanics.**—The flow of real and ideal fluids, emphasizing the influence of turbulence and the application to ocean currents.

539. (1) **Waves and Tides.**—Surface and internal waves, tides of the oceans, tidal currents.

540. (2) **Turbulence.**—A discussion of turbulent fluid motion, presenting both the empirical aspects and the development of statistical theories, including the spectrum of turbulence and similarity and equilibrium hypotheses. Textbook: Hinze, *Turbulence*. (Offered in 1966-67 and alternate years.)

541. (1) **Dynamic Meteorology.**—Development of basic equations of motion and their application to the atmosphere. A knowledge of vector calculus is assumed.

544. (1) **Magnetic Resonance Seminar.**—Selected topics in the recent developments of the theory and applications of magnetic resonance.

545. (1) **Theoretical Physics Seminar.**—Selected topics from current literature.

549. (6) **Master's Thesis.**

555. (1-3) **Directed Studies in Physics.**—With approval of the Head of the Department, advanced studies under the direction of a staff member may be arranged in special cases.

560. (1-3) **Directed Studies in Biophysics.**—With approval of the Head of the Department, advanced studies under the direction of a staff member may be arranged in special cases.

561. (2) **Advanced Biophysics Laboratory.**—Experimental work chosen to widen the student's experience and increase his competence in a variety of biophysical research techniques.

562. (1) **Biophysics Seminar.**—Selected topics of current interest.

570. (1) **Radio Astronomy.**—Emission, propagation and detection of radio noise from the solar system, galaxy and extragalactic radio sources. This course complements E.E. 593 which deals with instrumentation for radio astronomy.

649. **Ph.D. Thesis.**

COURSES FROM OTHER FACULTIES

Students transferring from another faculty to the Faculty of Science may obtain credit for any of the following courses with the approval of the Dean. In exceptional circumstances, students in the Faculty of Science may include some of these courses in their programmes, with the approval of the Dean and the Department in which the course is offered.

Anatomy

(See also Faculty of Medicine calendar)

390. (3) **Basic Human Anatomy.** [3-0; 3-0]

Applied Science

(See also Faculty of Applied Science calendar)

270. (3) **Strength of Materials.** [2-0-1; 2-0-1]
278. (3) **Materials of Science.** [2-2*-0; 2-2*-0]

Architecture

(See also School of Architecture calendar)

305. (3) **Architectural History.** [3-0; 3-0] (Credit will not be given for both Architecture 305 and Fine Arts 125)
405. (3) **Architectural History.** [3-0; 3-0] (Not open to pre-Architecture students)
424. (1½) **History of Urban Form.** [3-0; 0-0]
425. (1½) **History of Urban Planning.** [0-0; 3-0]

Chemistry

(See also Faculty of Applied Science calendar)

155. (3) **Analytical and General Chemistry.** [2-3-0; 2-3-0] (Credit will be allowed for only one of Chemistry 155, 200 or 205)
255. (3) **Physical Chemistry.** [2-0-0; 2-0-2]
352. (2) **Modern Analytical Methods.** [1-3-0; 1-3-0]
457. (2) **Advanced Physical Chemistry.** [3-0-0; 3-0-0]

Civil Engineering

(See also Faculty of Applied Science calendar)

250. (1) **Plane Surveying.** (12 days, 8 hrs./day)
360. (3) **Fluid Mechanics I.** [2-2*-2*; 2-2*-2*]
367. (2) **Solid Mechanics I.** [2-2-0; 2-2-0]
453. (1½) **Photogrammetry.** [2-0-3; 0-0-0]
472. (2) **Soil Mechanics II.** [2-0-0; 2-0-0]
476. (½) **Law in Engineering.** [0-0-0; 1-0-0]

Commerce

(See also Faculty of Commerce calendar)

151. (3) **Fundamentals of Accounting.** [2-2; 2-2]

Electrical Engineering

(See also Faculty of Applied Science calendar)

- 253. (3) Introduction to Solid State Electronics. [2-2*-2*; 2-2*-2*]
- 351. (3) Alternating Current Circuits and Electronics. [2-3*-3*; 2-3*-3*]
- 355. (3) Circuit and Signal Analysis. [3-0-2; 3-0-2]
- 357. (3) Electronic Devices. [2-3*-2*; 2-3*-2*]
- 451. (3) Electrical Circuits and Apparatus. [2-2*-2*; 2-2*-2*]
- 465. (3) Applied Electronics. [2-2-1; 2-2-1]
- 467. (2) Engineering Systems. [2-0-2*; 2-0-2*]
- 469. (2) Circuit Distributed Parameter. [2-0-2*; 2-0-2*]
- 475. (3) Systems Laboratory. [2-3-2*; 2-3-2*]

Forestry

(See also Faculty of Forestry calendar)

- 270. (2) Wood Anatomy [2-4; 0-0]
- 278. (2) Wood Physics. [0-0; 2-4]
- 318. (3) Forest Pathology. [2-2; 2-2]
- 410. (1½) Principles of Forest Entomology. [0-0; 2-2]
- 450. (2) Advances in Silviculture. [2-0; 2-0]

Geology

(See also Faculty of Applied Science calendar)

- 150.(3) General Geology. [2-2-0; 2-2-0]

Mathematics

(See also Faculty of Applied Science calendar)

- 155. (3) Calculus. [4-0-0; 4-0-0]
- 156. (3) Analytic Geometry and Algebra. [2-0-0; 2-0-0]
- 250. (3) Vector Analysis and Differential Equations. [3-0-0; 3-0-0]
- 251. (2) Series and Elementary Statistics. [2-0-2; 2-0-0]
- 350. (3) Applied Calculus and Differential Equations. [3-0-0; 3-0-0]
- 355. (2) Programming and Numerical Algorithms. [2-0-0; 0-0-0] or [0-0-0; 2-0-0]
- 357. (2) Industrial Statistics and Linear Programming. [2-0-0; 0-0-0] or [0-0-0; 2-0-0]
- 360. (3) Real Variable. [2-0; 2-0]
- 362. (3) Linear Algebra. [2-0-0; 2-0-0]
- 364. (2) Complex Variable. [2-0-0; 2-0-0]
- 450. (3) Analysis. [3-0-0; 3-0-0]
- 452. (2) Theory and Applications of Differential Equations. [3-0-0; 3-0-0]

Mechanical Engineering

(See also Faculty of Applied Science calendar)

- 491. (2) Industrial Administration. [2-0-0; 2-0-0]
- 492. (1) Engineering Economics. [2-0-0; 2-0-0]

Metallurgy

(See also Faculty of Applied Science calendar)

- 350. (1) Metallurgical Thermodynamics I. [0-0-0; 2-0-0]
 - 351. (1) Laboratory Methods. [0-3*-0; 0-3*-0]
 - 374. (3) Physical Metallurgy I. [2-3*-0; 2-3*-0]
 - 450. (2) Metallurgical Thermodynamics II. [2-0-0; 2-0-0]
 - 462. (2) Thermodynamics of Metal Systems. [2-0-0; 2-0-0]
 - 470. (2) Structure of Metals II. [2-0-0; 2-0-0]†
 - 472. (1) Physical Metallurgy II. [2-3*-0; 2-3*-0]†
- †Credit will not be given for both Metallurgy 470 and 472

Mineral Engineering

(See also Faculty of Applied Science calendar)

- 351. (3) Mineral Exploration and Valuation. [2-0-2; 2-0-2]
- 457. (3) Introduction to Rock Mechanics. [2-1-0; 2-1-0]

Oceanography

(See also Faculty of Graduate Studies calendar)

- 400. (1) Introduction to Synoptic Oceanography.
- 401. (1) Introduction to Dynamic Oceanography.
- 402. (1) Introduction to Chemical Oceanography.
- 403. (1) Introduction to Biological Oceanography.
- 404. (1) Introduction to Geological Oceanography.

Physics

(See also Faculty of Applied Science calendar)

- 155. (3) Mechanics. [2-0-4; 2-0-4]
- 156. (3) Heat, Light and Sound. [2-3*-0; 2-3*-0]
- 250. (3) Electricity and Magnetism. [2-3-0; 2-3-0]
- 251. (3) Electric and Magnetic Fields. [2-3*-0; 2-3*-0]
- 351. (2) Electricity and Magnetism. [2-0-0; 2-0-0]
- 352. (2) Introduction to Mathematical Physics. [2-0-0; 2-0-0]
- 358. (3) Physical Optics. [2-3-0; 2-3-0]
- 372. (2) Introductory Atomic Physics. [2-0-0; 2-0-0]
- 452. (3) Atomic and Nuclear Physics. [3-0-0; 3-0-0]
- 456. (2) Classical Mechanics. [2-0-0; 2-0-0]
- 458. (1) Fluid Mechanics. [0-0-0; 2-0-0]
- 480. (1) Seminar [0-0-1; 0-0-1]
- 472. (2) Modern Physics. [2-0-0; 2-0-0]

Plant Science

(See also Faculty of Agriculture calendar)

- 321. (1/2) Biometrics. [3-2; 0-0]
- 322. (1 1/2) Design of Experiments. [0-0; 2-2]
- 407. (3) Genetics and Breeding of Crops. [2-2; 2-2]

Soil Science

(See also Faculty of Agriculture calendar)

- 200. (1 1/2) An Introduction to the Study of Soils. [3-2; 0-0]
- 203. (2) General Forest Soils. [1-2; 2-2]
- 312. (1 1/2) Soil Microbiology. [0-0; 1-4]
- 313. (1 1/2) Soil Physics. [2-2; 0-0]
- 314. (1 1/2) Soil Conservation. [2-2; 0-0]
- 404. (1 1/2) Chemical Properties of Soils. [2-2; 0-0]
- 416. (1 1/2) Soil Genesis, Classification and Cartography. [0-0; 2-2]

**AWARDS
AND
FINANCIAL ASSISTANCE**

**THE UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER 8 • BRITISH COLUMBIA CANADA**



1966-67

MEDALS, FELLOWSHIPS, SCHOLARSHIPS, PRIZES, BURSARIES, AND LOANS

GENERAL REGULATIONS

1. All awards of medals, scholarships, fellowships, prizes, and bursaries are made on the recommendation of the Joint Faculty Committee on Prizes, Scholarships, and Bursaries (University Scholarship Committee), unless otherwise provided for by special resolution of Senate. Awards, when announced by the University, are final.

2. Medals, scholarships, fellowships, prizes, bursaries, and loans are open to winter session students only, unless otherwise stated, and marks obtained in summer session courses are not taken into account in awarding them.

3. If the award of a medal, scholarship, fellowship, or prize is based on an examination, no award will be made to a candidate who obtains less than 75 per cent. of the possible marks.

4. To be eligible for a general proficiency scholarship a student must take the full year's course, which must include the required courses for the year in which he is registered. Where credit has already been obtained in a required subject, however, another course may be substituted, with permission of the faculty concerned. The standing of students taking more than the required number of units will be determined on the basis of the required number of units to be chosen in a manner most advantageous to the students.

5. Except in cases approved by Senate, no student may enjoy the proceeds of more than one scholarship in the same academic year, and the scholarships thus relinquished will be awarded to the candidates next in order of merit.

6. A winner, if he so desires, may retain the honour of winning an award but resign the monetary value. Any funds thus made available will be used for additional awards or loan funds.

7. Scholarships, fellowships, and bursaries under the jurisdiction of the University are payable in two instalments, one at the beginning of each term. Payments will be made only to those who continue their studies to the satisfaction of the faculty concerned and the Committee, and may be withheld for unsatisfactory attendance, conduct, or progress. A scholarship may be reserved for one year, provided the student shows satisfactory reasons for postponing attendance. Postponement of University Entrance and Senior Matriculation scholarships will be granted on medical grounds only. Application for postponement must be made to the Dean of Inter-Faculty and Student Affairs.

8. In awarding bursaries consideration will be given to the financial need of applicants.

9. If invested funds do not provide the necessary revenue for any endowed scholarship, fellowship, prize or bursary, payment of the award will be reduced or withheld.

10. The University does not guarantee the payment of any prizes, bursaries, scholarships, or fellowships other than those from the funds of the University. With respect to prizes, bursaries, scholarships, or fellowships based upon the gifts of individuals or associations other than the University, no award will be made unless the funds required have been actually received from the private donor or donors.

11. The Senate of the University of British Columbia reserves the right to change the terms governing an award, so that they may better meet new con-

ditions, may more fully carry out the intentions of the donor or maintain the usefulness of the benefaction. The right so reserved shall be exercised by a resolution of the Senate duly confirmed by the Board of Governors, provided always that a year's notice shall be given in Senate of any proposed change and that the donor or his representatives, if living, shall be consulted about the proposed change.

12. Cheques in repayment of loans should be made payable to "The University of British Columbia" and forwarded to the office of the Accountant.

FOR HEADS OF THE GRADUATING CLASSES

The Governor-General's Gold Medal—A gold medal, presented by His Excellency the Governor-General of Canada, will be awarded to the student whose record, in the opinion of the Faculties, is the most outstanding in the graduating classes in Arts and Science (B.A. and B.Sc. programmes).

The Wilfrid Sadler Memorial Gold Medal—A gold medal, given by Sigma Tau Upsilon Honorary Agricultural Fraternity in memory of Professor Wilfrid Sadler, Professor and Head of the Department of Dairying, 1918-33, will be awarded to the student standing at the head of the graduating class for the B.S.A. degree.

The Association of Professional Engineers Gold Medal—A gold medal, given by the Association of Professional Engineers of the Province of British Columbia, will be awarded to the student in the graduating year of Applied Science (B.A.Sc. course) whose record, in the opinion of the Faculty, is the most outstanding.

The Kiwanis Club Gold Medal and Prize—A gold medal and a cash prize of \$100, given by the Kiwanis Club of Vancouver, B.C., will be awarded to the student standing at the head of the graduating class for the B.Com. degree.

The University Medal for Arts and Science—This medal will be awarded to a student in the graduating class for the degree of B.A. or B.Sc. This medal will be awarded to the student obtaining highest standing in the degree category which does not include the winner of the Governor-General's Medal.

The Law Society Gold Medal and Prize—A gold medal, presented by the Law Society of British Columbia, will be awarded to the student obtaining the highest aggregate marks in the Final Year in the Faculty of Law. This award will be accompanied by a cash grant equivalent to the individual's Call and Admission Fee.

The Hamber Gold Medal and Prize—A gold medal and a cash prize of \$250, presented by the late Honourable Eric W. Hamber, C.M.G., B.A., LL.D., Chancellor of this University from 1944 to 1951 and Chancellor Emeritus from 1951 to 1960, will be awarded annually to the student graduating in the Faculty of Medicine with the most outstanding record throughout the medical course. The winner of this medal and prize is not precluded from being considered for the Hamber Scholarship.

The Horner Gold Medal for Pharmacy—This medal, known as the "Horner Gold Medal", is awarded annually by Frank W. Horner Limited of Montreal, to the head of the graduating class, Faculty of Pharmacy.

The Helen L. Balfour Prize—A prize of \$250, made possible by a bequest from the late Helen L. Balfour, will be awarded annually to the student obtaining highest standing in the Final Year for the degree of B.S.N.

The Canadian Institute of Forestry Medal—A gold medal, the gift of the Canadian Institute of Forestry, will be awarded to the student in the graduating class in Forestry (B.S.F. or B.A.Sc. course) who, in the opinion of the Faculty of Forestry, has made the best all-round record in professional forestry in all years at University, and who has demonstrated a high quality of character, leadership, sportsmanship, and scholarship.

The H. R. MacMillan Prize in Forestry—A prize of \$100, the gift of H. R. MacMillan, Esq., C.B.E., D.Sc., LL.D., will be awarded to the student standing at the head of the graduating class for the degree of B.S.F.

The Dr. Maxwell A Cameron Memorial Medals and Prizes—To commemorate the distinguished life and work of Dr. Maxwell A Cameron (1907-1951), first Director of the School of Education at this University and author of the Cameron Report on Education, the British Columbia Teachers' Federation annually donates two awards, each consisting of a silver medal and a prize of \$50. They will be awarded, one in the secondary teaching field and the other in the elementary teaching field, to those students in the Final Year of the B.Ed. course who, in the opinion of the Dean and the Director of the Division concerned, are the outstanding students in the graduating class.

The Royal Architectural Institute of Canada Medal—This medal is available to a student in the graduating class for the degree of Bachelor of Architecture. The award will be made only to a student who, in the opinion of the School, has attained a high proficiency in the course and shows those qualities of character and ability which promise outstanding achievement in the profession. In the determination of standing for this award, the work taken in the final two years will be considered. The award will not necessarily be made every year.

The Ruth Cameron Medal for Librarianship—This medal, honouring the memory of Miss Ruth E. Cameron, for many years Chief Librarian of the City of New Westminster, is offered annually by the Board of the New Westminster Public Library. It will be awarded to the student whose record in the course for the degree of B.L.S. is, in the opinion of the School of Librarianship, most outstanding.

The Canadian Association for Health, Physical Education and Recreation Medal—This silver medal, gift of the Vancouver and District Branch, Canadian Association for Health, Physical Education, and Recreation, will be awarded to the Head of the Graduating Class for the degree of Bachelor of Physical Education.

AWARDS FOR GRADUATE STUDY AND RESEARCH

Graduate students proceeding to Librarianship, Social Work or Teacher Training should consult pages 59, 75 and 41 respectively.

In most cases, winners of graduate fellowships and scholarships are selected by the University Scholarship Committee from among those nominated directly by departments, schools, and faculties. Unless the calendar description of an award specifies another procedure, a student who wishes to be considered for a graduate fellowship or scholarship should consult the head of the department concerned with his major field of study. In general awards are open only to students taking a full programme of study at this University in the winter session. Departments should be consulted before February 15.

Attention is directed to awards made by other institutions, pages U137-147. For most of these awards, special applications must be submitted.

The Alan Boag Scholarship—As on page 17.

Aluminium Laboratories Limited Fellowship—This fellowship, the gift of Aluminium Laboratories Limited, Montreal, is offered annually to students admitted for postgraduate studies leading to a Master's or Doctor's degree in the mathematical and physical sciences, pure and applied. Preference will be given to candidates pursuing studies in the field of physical metallurgy. The tenure will be for one year with a stipend of \$2000 plus tuition fees. During tenure the holder of the fellowship shall not have teaching duties in excess of three hours per week.

The Anne Wesbrook Scholarship—This scholarship of \$350, given by the Faculty Women's Club of the University of B.C., is open to a woman student of the graduating class of this University who is proceeding in the following year to graduate study in this or any other approved university.

The Blundell Graduate Fellowships—Two graduate fellowships of \$3000 each, gift of Alfred Blundell, M.A., B.C.L.(Oxon.), are offered annually to students proceeding in the field of the humanities to a higher degree in the Faculty of Graduate Studies. The winners of these fellowships, who must engage in full-time graduate studies and/or research extending over the period of a year, will be selected on the basis of academic excellence, evidence of ability in research and investigation, and promise of continuing interest and participation in their chosen field of study. They will be selected by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries from candidates nominated by the academic departments.

The Brissenden Scholarship—As on page 30.

British Columbia Hydro and Power Authority Graduate Scholarships—Three scholarships of \$750 each—two in the pure or applied sciences, and one in law, business administration, the social sciences, or the humanities—are offered by British Columbia Hydro and Power Authority for graduate study at this University. Selection will be made by the Scholarship Committee in consultation with the appropriate departments.

The British Columbia Loggers' Association Entomological Scholarship—As on page 52.

The British Columbia Sugar Refining Company Limited Scholarships—Scholarships to the total of \$3500, the gift of the British Columbia Sugar Refining Company Limited, are available annually for students in Agriculture, Bacteriology, Botany and Biology, Chemistry, and Home Economics. Winners of these awards will be selected from recommendations submitted by the departments concerned. Selection will be made on the basis of scholastic standing and promise of ability in research.

The British Columbia Teachers' Federation Postgraduate Scholarships for Teachers—See page 139.

The British Columbia Telephone Company Graduate Scholarships—Four scholarships of equal value, to the total of \$2500, the gift of the British Columbia Telephone Company, are available for graduates. Of these awards, one will be available in Community and Regional Planning, one in Commerce and Business Administration, and two in Electrical Engineering. Awards will be made on the basis of scholastic standing and promise of ability in research to students undertaking an approved programme of graduate study and research at the University of British Columbia.

The Burroughs Wellcome Fellowship in Anaesthesiology and Applied Pharmacology—This fellowship of \$1000, the gift of Burroughs Wellcome & Co. (Canada) Ltd., is available for postgraduate study and research in anaesthesi-

ology. The award will be made on the recommendation of the Faculty of Medicine.

The Canadian Industries Limited Fellowship—A fellowship of \$2000 plus a maintenance grant of \$400 to the University, the gift of Canadian Industries Limited, is available to a student proceeding toward a doctorate degree in the field of Chemistry, Chemical Engineering, or Metallurgy. The fellowship is open to university graduates who are Canadian citizens or to university graduates who are intending to follow a career in Canada, with preference to Canadian citizens. The recipient, who will be selected on the basis of scholarship and research ability, will be expected to pursue investigation in one of the fields mentioned above. The topic of research will be chosen by the department concerned.

The Canadian Western Pipe Mills Ltd. Fellowship in Metallurgy—A fellowship of \$1000, the gift of Canadian Western Pipe Mills Ltd., Port Moody, B.C., is offered annually to students proceeding to a graduate degree in Metallurgy. The award will be made to a student selected by the Department of Metallurgy on the basis of high academic standing and promise of ability in research.

CBC Prizes in Television and Radio Writing—As on page 19.

Chevron Standard Limited Graduate Fellowship—Chevron Standard Limited offers annually five graduate fellowships which are tenable in selected Canadian universities to students proceeding to a graduate degree in one of the fields of Geology, Geophysics, or Petroleum Engineering. The fellowships are tenable for one year in the amount of \$1,000 each, plus a grant of \$500 to the university department concerned. The awards are primarily intended to assist male Canadian students showing an interest in earth science related to oil exploration and to students who are interested in petroleum development and production. They will be awarded on the basis of scholastic ability, field of interest, the recommendation of the Department in which the student plans to conduct his graduate work, plus the concurrent recommendation of the Head of the Department in which the student conducted his undergraduate studies. Application forms which list the universities in which the fellowships are tenable may be obtained from the Dean of Inter-Faculty and Students Affairs, the Departmental Head, or by writing directly to the Company. They should be prepared in duplicate, one copy to be forwarded to the Head of the Department in which the candidate is applying for admission, and the other to the Secretary, Aids to Education Committee, the Chevron Standard Company, 329A—6th Avenue, S.W., Calgary, Alberta, prior to March 31st of the year in which the graduate program is to be undertaken.

The Class of Agriculture '21 Graduate Scholarship—On the occasion of the thirty-fifth anniversary of graduation, the Class of Agriculture '21 established a scholarship for graduate study and research in agriculture leading to a higher degree. In awarding this scholarship consideration will be given academic standing, character, and promise of ability in investigation and research.

Crown Zellerbach Canada Foundation Graduate Scholarship in Economics and Political Science—A scholarship of \$500, the gift of Crown Zellerbach Canada Foundation, will be awarded to a graduate student who is beginning or continuing studies, at this University, towards a Master's degree in the field of Economics or Political Science or a combination of these fields. Should no graduate in these fields qualify, the scholarship will be awarded to a graduate in some other field. In awarding this scholarship consideration will be given to academic standing, personal qualities, and research ability.

The Don Buckland Memorial Scholarship in Forest Pathology—As a memorial to Dr. Donald C. Buckland and in tribute to his distinguished career, his many friends have established a fund, from which the annual income of \$150 will be awarded annually as a scholarship for study in forest pathology at this University. Preference will be given to a graduate forester who has demonstrated research ability and whose studies will be materially furthered by financial support.

The Dr. and Mrs. J. E. Kania Scholarship—As on page 47.

The Dr. A. W. D. (Bill) Knox Memorial Award—This fund was established by friends in memory of Dr. Bill Knox, a young B.C. surgeon tragically deceased on the threshold of his career. Awards will be made to assist worthy candidates in post-graduate surgical study.

The Dr. F. J. Nicholson Scholarships—Out of the proceeds of a fund donated by the late Dr. Francis John Nicholson, the following scholarships will be awarded annually for the purpose of enabling students to do graduate study in the University of British Columbia or in any other approved university: (1) One scholarship of the value of \$500 for graduate work in Chemistry. Applicants must be Honours graduates in Chemistry of the Faculties of Arts or Science, with the degree of B.A., B.Sc., M.A., or M.Sc., or graduates in Chemical Engineering of the Faculty of Applied Science, with the degree of B.A.Sc. or M.A.Sc. (2) One scholarship of the value of \$500 for graduate work in Geology. Applicants must be graduates of the Faculty of Applied Science in Geological or Mining Engineering, with the degree of B.A.Sc. or M.A.Sc. (3) An additional scholarship of \$500 as described in (1) or (2). Recipients must be qualified to undertake graduate and research work in respect of scholarship, ability, character, and health. These scholarships will be granted with due consideration for the financial status of the candidate. The spirit of the endowment is to aid those to whom financial help is necessary or of material assistance. Winners must be graduates of the University of British Columbia, have British citizenship, and be not more than 30 years of age on the last day of the final examinations. Preference will be given in making awards to native-born British Columbians.

The Edith Ashton Memorial Scholarship—A scholarship of \$250, given by Mrs. Daniel M. Armstead in memory of Edith Ashton, will be offered in the Department of Biology and Botany. This scholarship will be awarded to an outstanding graduate student whose topic of research is in the field of marine and freshwater botany or some field approved by the Head of the Department.

The Ernestine A. M. E. Kania Scholarship—As on page 20.

The Finning Tractor & Equipment Co. Ltd. Graduate Scholarship—A scholarship of \$400, the gift of Finning Tractor & Equipment Co. Ltd., will be available for graduate study and research at the University of British Columbia in the session 1966-67. It will be awarded by the Joint Faculty Committee on Prizes, Scholarships and Bursaries to a student who, because of his academic record, is worthy and deserving of assistance.

Financial Executives Institute Graduate Scholarship—To encourage graduate studies in Controllershship and Financial Management, the Vancouver Chapter, Financial Executives Institute, provides a scholarship of \$100. The scholarship will be awarded in the first term, annually, upon the recommendation of the Faculty, to a graduate student with a high previous academic record in accounting who is interested in the Accounting and Finance seminars at the University of British Columbia.

The Fisheries Association of B.C. Scholarships—As on page 73.

The Frank F. Wesbrook Fellowships—As a memorial to the late Dr. F. F. Wesbrook, first President of the University of British Columbia, six fellowships are offered annually to students proceeding to graduate study and research at the University in microbiology or bacteriology. The gift of Dr. H. R. MacMillan, these fellowships are open to Canadian citizens who are beginning and continuing studies toward the Ph.D. degree. Each fellowship has the value of \$3200 and is renewable for attendance at this University for two further years. A candidate must be a Canadian citizen, have an undergraduate average of at least 75% with first class grades in at least half his subjects, have a potential for research and investigation, and indicate, by his record, promise of success in advanced levels of study. In accepting the award, a candidate must agree to remain in Canada for a reasonable period following completion of his Ph.D. programme, if he is offered a suitable position.

The Frederick Armand McDiarmid Scholarship—This scholarship, a memorial to Frederick Armand McDiarmid, has been provided by Neil H. McDiarmid. It will be awarded to a student, graduate or undergraduate, with preference to those in Mining. Selection will be based on academic standing, practical ability and experience, and promise in research.

The General Accountants' Scholarship—In order to stimulate scholarship and research in the general area of business administration and, particularly, in the field of accountancy, the General Accountants' Association has announced its intention of making an annual gift of \$1500 for the purpose of an award to a student proceeding to, or engaged in, graduate studies. Normally, such studies are expected to be undertaken at the Faculty of Commerce and Business Administration but exceptions may be made to accommodate the special needs of graduate students. The award will be made at the discretion of the Dean of the Faculty of Commerce and Business Administration to a candidate whose academic record, ability, and other qualifications, indicate a capacity for distinguished work at the graduate level.

The Giant Yellowknife Mines Scholarship—This scholarship of \$2000, the gift of Giant Yellowknife Mines Limited, is offered to students pursuing graduate studies at this University in mineral engineering and undertaking work in a field specifically relating to the mining industry. An additional sum of \$500 will be made available to the Department to cover auxiliary costs and expenses. The award will be made by the University on the recommendation of the Department of Mineral Engineering.

The Graduate Scholarships in Slavonic Studies—Through the generosity of Walter C. Koerner, Esq., a number of awards have been established in the field of Slavonic Studies in honour of Dr. William J. Rose, distinguished Canadian scholar and teacher, and Emeritus Professor of Polish Language and Literature, University of London. Included are an annual teaching fellowship of \$1000 and two annual scholarships of \$300 each for students beginning or continuing graduate studies in Slavonic Studies at this University. These awards will be made to students who have high academic standing and have shown special aptitude for research.

The H. C. LePatourel Fellowship in Hospital Pharmacy—This fellowship of \$500, provided annually from the estate of the late H. C. LePatourel, is open to graduates of the Faculty of Pharmacy who intend to further their practical training through one year of hospital pharmacy internship. The award will be made by the Faculty, after consultation with the hospital concerned, to a student who not only has a good academic record but who has shown interest and promise in the field of hospital pharmacy.

The H. R. MacMillan Family Fellowships—Through the generosity of H. R. MacMillan, C.B.E., D.Sc., LL.D., forty-five fellowships, each in the amount of \$3200 per annum (with an additional amount of \$500 for the University), are offered to outstanding students admitted as candidates for the Ph.D. degree and proceeding with full-time studies at the University of B.C. To be eligible a candidate must be a Canadian citizen, have an undergraduate average of at least 75% with first class grades in at least half his subjects, have a potential for research and investigation and indicate, by his record, promise of success in advanced levels of study. A candidate accepting an award must agree to remain in Canada for a reasonable period following completion of his Ph.D. programme, if he is offered a satisfactory position. Subject to satisfactory progress, a fellow may have his award renewed for two further years or until he has received his degree, whichever is the shorter period. Winners will be selected by the Scholarship Committee from among those nominated for graduate fellowships by faculties and departments.

The J. A. Beckow Graduate Scholarship—This scholarship of \$500, the gift of J. A. Beckow Limited, will be awarded to a graduate student who is continuing studies at the University towards a Master's Degree in the field of Science or Mechanical Engineering. If, in the opinion of the University Scholarship Committee there is no qualified student, the said sum will be used for students completing the Third Year of Mechanical Engineering and proceeding to Fourth Year.

The John and Annie Southcott Memorial Scholarship—A scholarship of \$100, provided annually from the estate of the late Mrs. Thomas H. Kirk, will be awarded to that student who, possessing exceptional aptitude for research, either intends to pursue, or is already pursuing some approved investigation in the field of British Columbia history. The scholarship will normally be awarded to a Fourth Year student or to a graduate proceeding to a higher degree, but may be awarded to a student of the Third Year.

John Boyd Scholarship (donated through the Vancouver's Men's Canadian Club)—A scholarship of \$300, portion of a gift of \$500 from John Boyd (Standard-General Construction, International Ltd.), will be available to graduates in Civil Engineering at the University of British Columbia to undertake graduate study in engineering at this or any approved university. Recipients must be qualified to undertake graduate work in respect of scholarship, ability, character, and health. If, in the opinion of the Department of Civil Engineering, no applicant is sufficiently qualified the sum will be used to provide scholarships or bursaries for students completing the Third Year of Civil Engineering, and proceeding to the Fourth Year.

Lamond, Dewhurst and Associates Ltd. Scholarship in Industrial Psychology—A scholarship of \$200, the gift of Lamond, Dewhurst and Associates Ltd., is offered annually to male students who intend to pursue a career in the field of industrial psychology. The award will be made by a committee of the Department of Psychology to the qualified male student who attains the highest marks in the work of the senior undergraduate year. In the event that the winner does not continue his graduate degree studies in the field of industrial psychology, the award will revert to the next highest qualified candidate.

Lead-Zinc Research Fellowship—The expanded research program of the International Lead Zinc Research Organization offers a fellowship of \$1500 to a student proceeding to a graduate degree in Metallurgy in the University of British Columbia. The recipient, who will be selected on the

basis of scholarship and research ability will be expected to pursue investigation in the field of metallurgy or materials science. The topic of research will be chosen in consultation with the Department of Metallurgy. A further sum of \$1000 will be available for the Fellow should he continue the research studies through four summer months.

The Lefevre Gold Medal and Scholarship—Out of funds provided by the late Mrs. Lefevre in memory of her husband, Dr. J. M. Lefevre, a gold medal and scholarship will be awarded annually to the student standing highest in general proficiency and research ability in one of the following courses: (a) Honours in Chemistry in the Faculty of Arts or Science; (b) Chemical Engineering in the Faculty of Applied Science. The award will be based upon the work of the last two years in these courses. The value of the scholarship is approximately \$200. The winning of this scholarship will not preclude the holder from enjoying the proceeds of a further award.

The Leonard S. Klinck Fellowships—In honour of Dr. Leonard S. Klinck, President Emeritus of the University of British Columbia, six fellowships are offered annually to students proceeding to graduate studies and research at the University in a field of agriculture. The gift of Dr. H. R. MacMillan, these fellowships are open to Canadian citizens who are beginning and continuing studies toward the Ph.D. degree. Each fellowship has the value of \$3200 and is renewable for attendance at this University for two further years. A candidate must be a Canadian citizen, have an undergraduate average of at least 75% with first class grades in at least half his subjects, have a potential for research and investigation, and indicate, by his record, promise of success in advanced levels of study. In accepting the award, a candidate must agree to remain in Canada for a reasonable period following completion of his Ph.D. programme, if he is offered a suitable position.

The Law Society of British Columbia Fellowship—A fellowship up to \$3000, provided by the Law Society of British Columbia, is offered in competition to graduates or graduating students of the Faculty of Law, University of B.C., or of other Canadian Law Schools, who are proceeding to a full programme of graduate studies in a field of law at a recognized institution. The fellowship will not necessarily be offered every year, and when offered will be awarded only if there is a highly qualified applicant. Applications will be considered only from applicants who, on completion of their graduate programme are willing, if offered the opportunity, to join the staff of the Faculty of Law at the University of B.C., and who have outstanding and other qualifications. Each applicant must apply by letter, which must be received by the Dean of Inter-Faculty and Student Affairs, University of B.C., not later than March 15th. The letter must contain the essential details of the applicant's academic career to date, his proposed plans for graduate study, and the assurance of his willingness to join the Faculty of Law, University of B.C., if he is offered a position. Supporting documents, which the applicant must arrange to be forwarded, should include an official transcript of his academic record, and three confidential letters of recommendation from the dean and instructors of the Law School from which he has graduated or will graduate.

The MCA Scholarship in Creative Writing—A scholarship of \$850, gift of MCA Inc., New York, was offered in the field of creative writing to a full-time graduate student attending the University in the session 1965-66. It was awarded to a student who showed exceptional promise in the field of creative writing for the performing arts (i.e. the legitimate theatre, motion pictures, or television). The award was made by the University. Further

information may be obtained from Professor R. Harlow, Buchanan Building, University of B.C.

The Morris Belkin Prize—As on page 32.

The McLean Fraser Memorial Fellowships—Three fellowships of \$750 each, established as a memorial to Dr. McLean Fraser by a bequest from Clara A. Fraser, are offered to graduates of the University of British Columbia with high academic standing and demonstrated outstanding research ability in Zoology during their undergraduate years. They will be awarded for postgraduate study and research leading to a postgraduate degree in Zoology at this University or at a university or research foundation approved by the University of British Columbia.

The MacMillan, Bloedel and Powell River Limited Scholarship—For research in wood chemistry, or on a subject with application to the pulp and paper industry, MacMillan, Bloedel and Powell River Limited offers annually a scholarship of \$1500, open to Honours graduates in Chemistry in the Faculty of Arts or Science, or graduates in Chemical Engineering in the Faculty of Applied Science. The topic of research shall be chosen after consultation with the Department of Chemistry or Chemical Engineering of the University and MacMillan, Bloedel and Powell River Limited. Recipients must be qualified to undertake graduate and research work in respect of scholarship, research ability, personality, and health. Furthermore, if special aptitude is shown in carrying out this work, an equal amount may be offered for further graduate study and research in wood chemistry or a subject with application to the pulp and paper industry, in this or any other approved university.

The Macmillan Company of Canada Prizes in Creative Writing—As on page 22.

The Native Daughters of British Columbia Scholarship—A scholarship of \$150 is given by the Native Daughters of British Columbia to a Canadian-born graduate student for research work in the early history of British Columbia, such work to be carried on in the Provincial Archives in Victoria, B.C.

NOCA Forage Graduate Scholarship—The Shuswap-Okanagan Dairy Industries Co-Operative Association offers a scholarship of \$800 to a graduate student in Plant Science for study in the field of forage production. An additional amount of \$200 for travel and other expenses associated with the research work carried out by the student will be granted to the division of Plant Science, Faculty of Agriculture. The recipient of the scholarship will be selected on the basis of academic standing and promise of ability in research. The topic of research will be chosen after consultation with the project committee of the Association.

The Norman MacKenzie Fellowships—In honour of Dr. N. A. M. MacKenzie, President Emeritus of the University of British Columbia, six fellowships are offered annually to students proceeding to graduate studies and research at this University. The gift of H. R. MacMillan, these fellowships are open to Canadian citizens who are beginning and continuing studies (i) toward the Ph.D. degree in the field of international relations, or (ii) toward the Ph.D. degree in the field of history, political science, or economics concerned with Canadian affairs, or (iii) toward a higher degree in the field of international law. Each fellowship has the value of \$3200 and is renewable for attendance at this University for two further years. A candidate must be a Canadian citizen, have an undergraduate average of at least 75% with first class grades

in at least half his subjects, or, in the case of a graduate in Law, he must rank in the top ten percent of his class and have first or high second class standing in each subject. He must also have indicated a potential for research and investigation and promise of success in advanced levels of study. In accepting the award, a candidate must agree to remain in Canada for a reasonable period following completion of his Ph.D. programme, if he is offered a suitable position.

Northern Electric Graduate Research Fellowship—A fellowship of \$1500, the gift of Northern Electric Company Limited, Montreal, is available for graduate study at the University of British Columbia in the fields of Electrical Engineering, Engineering Physics, Physics, Physical Chemistry, Metallurgy and Applied Mathematics and preferably where thesis work can be expected to have implications for the communications industry. The accepted candidate must be a Canadian citizen or landed immigrant and a graduate of a recognized university.

Oppenheimer Bros. & Company Centennial Scholarship—As on page 37.

The Pacific Pine Co. Ltd. Scholarship in Forestry—A scholarship of \$300, gift of Pacific Pine Co. Ltd., New Westminster, is available for a student engaging in graduate study and research in Forestry at the University of British Columbia. It will be awarded on the recommendation of the Faculty of Forestry to a student who has a good scholastic record, and has shown special interest in and aptitude for the field of forest products. In making the award, consideration will be given to promise of ability in investigational and research work.

Pan American Petroleum Corporation Fellowship—A graduate fellowship of \$1800, plus tuition and fees, is offered in the session 1966-67 for graduate study and research in engineering, geology, or geophysics. Subject only to the restriction that it should have some relationship to the petroleum industry, the research problem is at the discretion of the University and the fellow. Selection of the winner is made by the University.

The Pfizer Fellowship in Hospital Pharmacy—Through the generosity of Pfizer (Canada), a fellowship of \$500 is open annually to graduating students in the Faculty of Pharmacy. This award will enable the winner to further his practical experience through one year of hospital pharmacy internship. In the selection of the winner, consideration will be given to academic record and to interest in, and aptitude for, hospital pharmacy. Final selection will be made by the Faculty in consultation with the hospital concerned.

The Poulenc Fellowship in Applied Physiology—This fellowship of \$500, established by Poulenc Limited, Montreal, is offered to individuals interested in anaesthesiology and related fields in medicine who will engage in post-graduate training in physiology. The award will be made on the recommendation of the Faculty of Medicine.

The Queen Elizabeth Scholarships (University of British Columbia)—These scholarships, to the total of \$50,000, were donated by H. R. MacMillan, Esq., C.B.E., D.Sc., LL.D., in July, 1959, to commemorate the visit of Her Majesty Queen Elizabeth to British Columbia and to the University. The gift provides five graduate scholarships of \$1000 each, to be awarded annually for ten years, commencing in May, 1960. The awards will be made to students with high standing beginning or continuing graduate studies at the University of British Columbia.

The Richard Claxton Palmer Scholarship—This scholarship of \$400 is endowed by colleagues and other friends of the late Richard Claxton Palmer,

B.S.A., M.S.A., D.Sc., Superintendent of the Experimental Station at Summerland and one time member of the Senate of this University, as a memorial to his private friendships, his public service, and his contributions in the field of science. It is offered to a graduate of the Faculty of Agriculture of the University of British Columbia who is proceeding to graduate study in this or any other approved university. Applicants should show evidence of scholarship and of ability to carry on investigation or research. In making the award, preference will be shown to a candidate engaged in continuing studies in horticulture or related fields of agriculture.

The Shane Fellowship—This fellowship of \$6000 annually is a gift of the Grand Chapter of British Columbia, Order of the Eastern Star. It is for postgraduate study and research in cancer. The fellowship is tenable at the British Columbia Cancer Institute in cooperation with the clinical departments of the Faculty of Medicine, and a candidate will be selected by a committee appointed by the Dean of the Faculty of Medicine and the Director of the British Columbia Cancer Institute.

The Standard Oil Company of British Columbia Limited Fellowship—For research the Standard Oil Company of British Columbia Limited offers a fellowship of \$1500 open to Honours graduates in Chemistry in the Faculties of Arts, Science or graduates in Engineering in the Faculty of Applied Science. The topic of research is to be chosen after consultation with the Department of Chemistry, or the appropriate department in Engineering of the University, and Standard of B.C. Recipients must be qualified to undertake graduate and research work in respect of scholarship, research ability, personality, and health.

The Tina and Morris Wagner Foundation Fellowships—These fellowships, established through a bequest from Mr. and Mrs. Morris Wagner, are offered to graduate students in the field of the humanities.

The U.B.C. Alumni Association Graduate Fellowship—A fellowship of \$3000, gift of the U.B.C. Alumni Association, is offered to students beginning or continuing studies at the University of B.C. in the Faculty of Graduate Studies in a full programme leading to a higher degree in any field. Only students with outstanding (first class) records will be considered. Other factors being equal, preference will be given to a U.B.C. graduate or the son or daughter of a graduate. In order to compete for this fellowship an applicant must (a) be accepted, without condition, as a candidate for the Master's or Doctor's degree by the department concerned; (b) notify the Dean of Inter-Faculty and Student Affairs by letter of his desire to be considered for the award. This letter must be submitted not later than March 1st. The University, in consultation with the Alumni Association, reserves the right, in the event that applicants are not sufficiently outstanding, to withhold the award or to offer two awards of \$1500 each.

The Ukrainian Professional and Business Men's Club of Vancouver Graduate Scholarship—A scholarship of \$1000, the gift of the Ukrainian Professional and Business Men's Club of Vancouver, is offered for graduate work at this University on a Ukrainian subject in the field of Slavonic Studies. It will be awarded from time to time, on the recommendation of the Head of the Department, to a student with an outstanding academic record and promise of achievement in the Slavonic field. At his discretion it will be granted for work in a single winter session or for two such sessions.

United Fishermen and Allied Workers' Union Scholarship in Fisheries—This scholarship of \$200, the gift of the United Fishermen and Allied Workers' Union, will be awarded annually to a student who is beginning

or continuing postgraduate studies and research in the field of fisheries. The award will be made to a student who not only has a good academic record, but has shown interest and promise in the field. In making the award consideration will be given to the financial circumstances of those who are eligible.

University Graduate Fellowships—A number of fellowships in the range \$2000-\$3000 are offered to graduates with first class records proceeding to the Ph.D. or Ed.D. degree, and in the range \$1200-\$2000 to outstanding graduates proceeding to a master's degree. These awards are intended primarily for students from other institutions but graduates of the University of B.C. or graduate students in attendance will be considered. Inquiries should be addressed to the head of the department concerned, by whom candidates must be nominated.

The Vancouver B'nai B'rith Hillel Foundation Scholarships—Vancouver B'nai B'rith Hillel Foundation will award two scholarships of the value of \$125 each in the winter session. The terms of the awards are as follows: these scholarships will be awarded to outstanding graduates of any of the four faculties—Arts, Science, Agriculture, and Applied Science. The winners shall indicate satisfactory plans for graduate study at the University of British Columbia or at any other university approved by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries. Only one scholarship shall be available in any one faculty in one year.

The VanDusen Graduate Fellowships in Forestry—Two fellowships of \$3000 each, the gift of the W. J. VanDusen Forestry Fund, a fund of Vancouver Foundation, are open to students proceeding to advanced work in forestry leading to a higher degree. They are tenable for one year at the University of British Columbia, but may be renewed. If they are renewed for one or more years, the Dean of Forestry and the supervisor of studies may authorize the holders to pursue their studies further at another university or in another country. A candidate must be qualified to undertake graduate work in respect of scholarship, research, ability, character, health, and indicate special interest in problems of forestry in British Columbia. The field of research and the thesis will be arranged after consultation between the donor or his representative and the Dean of Forestry. Awards are normally announced by April 15th for the following session.

The Vancouver Women's Canadian Club Scholarship in Canadian History
—As on page 33.

The Vancouver Sun Graduate Scholarship for Journalism—A scholarship of \$2000, the gift of The Vancouver Sun, is offered to graduating students or graduates of the University of British Columbia who, in the fall, intend to proceed to a full year's programme of study in an approved school or faculty of journalism, and who are planning a career in journalism in the newspaper field. The award will be made to a student who, in terms of ability and aptitude, experience, academic record, and proposed plans, is considered by the committee of selection to be best qualified. If, in the opinion of the Committee, no applicant is sufficiently outstanding, the award will be withheld. Each applicant must apply by letter, addressed to the Dean of Inter-Faculty and Student Affairs, University of B.C., Vancouver 8, B.C. In this letter he must (i) state his experience (if any) and interest in the newspaper field, outline his specific plans for the year of study and his future plans for a career in newspaper work; (ii) list the names and addresses of three references who are willing to write on his behalf. The letter of application must reach the University not later than March 15th. Evidence of acceptance by an approved school or faculty of journalism

should also be supplied. If this acceptance has not been received by March 15th, the candidate should nevertheless submit his application by this date and file the letter of acceptance as soon as possible.

The Warner-Lambert Research Fellowship in Pharmacy—A fellowship of \$1200, the gift of Warner-Lambert of Canada Limited, is offered annually for graduate study and research in the field of pharmacy. The winner will be selected by the Faculty of Pharmacy, with preference being given to graduates in Pharmacy of Canadian universities, and must enroll as a candidate for the degree of Master of Science in Pharmacy at this University. An additional \$300 will be paid to the Faculty toward the cost of materials and equipment required in the research undertaken.

The William Rea Scholarship in Television—A scholarship of \$1000 is offered annually by William Rea, Jr., vice-president of CHEK-TV Ltd., in honour of his father, a pioneer Edmonton educator. The scholarship is open to a University of British Columbia graduate or graduating student of either sex, who shows the best aptitude in terms of scholarship and extracurricular activity for a career in television through drama, music, writing, photography, engineering or business. The student may attend any recognized graduate school which will further his training in this area, and the scholarship may be renewed for one or more years in appropriate circumstances. Any graduate of graduating student interested should apply to the Dean of Inter-Faculty and Student Affairs by March 15th, and should request three or more instructors familiar with his work to supply confidential statements indicating his merits and their estimate of his ability to pursue work in one of the areas of television as outlined above. Definite details should be given as to the field of study in which the candidate desires to work.

Residence Fellowships

Dons and Resident Fellows will be appointed annually to positions at the Men's and Women's Residences (permanent) and at Fort Camp and Acadia Camp. While some of the Donships may be given to junior members of Faculty, students enrolled in the Faculty of Graduate Studies or taking professional training on the campus are eligible for appointment. Older undergraduates, particularly if they have had experience in dealing with young people, may also be considered. Resident Fellows will be appointed from among students in their senior year or in graduate courses.

Requests for application forms should be made to the Dean of Women (women) or the Office of the Housing Administrator (men). Application should be made before May 1.

SCHOLARSHIPS FOR UNDERGRADUATES

1. Scholarships and prizes are listed in the following order: General, Agriculture, Architecture, Arts, Commerce and Business Administration, Dentistry, Education and Teacher Training, Engineering, Forestry, Home Economics, Law, Librarianship, Medicine, Music, Nursing, Pharmacy, Physical Education, Rehabilitation Medicine, Science, Social Work, High School Graduation and Grade XIII, Extension and Miscellaneous, and Summer Session.

2. Awards listed under Arts or Science include not only those open to students taking courses leading to a B.A. or B.Sc. degree, but also those open to students taking preparatory courses for entrance to Architecture, Commerce, Dentistry, Engineering, Forestry, Law, Librarianship, Medicine, Nursing, and Pharmacy.

3. Attention of all students is drawn to the Government of B.C. and general awards described on page 17, to the Rhodes Scholarship, and other awards listed on pages 137-156. Attention of students in the graduating years is called to the awards listed on pages 137-147.

4. Many undergraduate scholarships and prizes are awarded automatically on the basis of merit or on nomination by departments, schools and faculties, and applications from students are not required. Students should apply only for those awards where the calendar description indicates that applications are necessary.

5. Scholarships are normally tenable only at this University and in the regular winter session. Winners are required to continue in a full year's programme.

GENERAL

Government of British Columbia Scholarships—These awards are available to students of the Province of British Columbia who are beginning or continuing a full programme of undergraduate studies at the University of British Columbia. Students taking the one-year teacher training course for graduates, the one-year course in Librarianship, and the First Year of Social Work are also eligible. Awards are not available for graduate study or for students registered as unclassified. Candidates for awards applicable to the session 1966-67 will be considered on the basis of standing received in the final examinations (excluding supplementals) in a full programme for the session 1965-66. Candidates in the University of British Columbia must take the final written examinations conducted by the University in April; those in Grade XII or XIII must write the examinations conducted in June by the Department of Education, B.C. Candidates will be considered only if they fulfill requirements of being domiciled in British Columbia, to the satisfaction of the Government Awards Committee. Eligible applicants who obtain First Class standing (an overall average of at least 80%) will receive a grant of one-half of the tuition fee. Awards, amounting to one-third the tuition fee, will also be made to the top Second Class students, up to the number of two thousand. All candidates must submit applications on special forms. Fuller and more precise details concerning these awards are available in a special circular issued by the Department of Education, B.C. Students at the University of B.C. should consult the Dean of Inter-Faculty and Student Affairs. High school students must apply through their schools before June 1st; University students must apply through the University before July 1st.

The Adelpian Scholarships—A scholarship or scholarships to the total of approximately \$1000, provided by a gift from an American donor, are offered to students from other countries beginning or continuing their studies as graduates or undergraduates at the University of British Columbia. The winners will be selected on the basis of academic standing, promise of success in their proposed programme of studies, and need for financial assistance. In particular they will be selected for studies which will be of benefit to their own countries in fields such as agriculture, forestry, medicine, dentistry, nursing and teaching.

The Alan Boag Scholarship—A scholarship of \$250, the gift of the trustees of a fund established by the late Alan Boag, is available for a student who in taking his major work in Commerce, History, Economics, International Studies, Law, Political Science, or Sociology and is proceeding to a further year of study at the University of British Columbia. This scholarship, which is open to graduates, or to undergraduates who have completed at least two

years at the University, will be awarded for the best essay or report on some aspect of socialism. In making the award special consideration will be given for originality in analysis and treatment. The award will be made on the recommendation of Professor Walter D. Young, Department of Political Science. If no essay reaches the required standard, the award will be withheld. Students intending to compete for this scholarship must obtain the approval of their essay subject from Professor Young. Essays must be submitted not later than March 31st.

The Amy Woodland Scholarships—One or more scholarships of at least \$100 each have been provided by a bequest from the late Archibald Raworth. They will be awarded annually to students who are academically worthy and deserving and who are beginning or continuing studies at the University of B.C. Insofar as is practicable, the awards will be made to students who have for at least two years during school studies, attended the Amy Woodland School or the Central School at Cranbrook, B.C. Consideration will be given by the University to students recommended by the Board of School Trustees of School District No. 2, Cranbrook, B.C. Eligible students should apply by May 15th.

The Archibald Raworth Scholarships—One or more scholarships of at least \$100 each have been provided by a bequest from the late Archibald Raworth. The scholarships will be awarded annually to academically worthy and deserving students beginning or continuing studies at the University of B.C. Insofar as is practicable, the awards will be made to students who have for at least two year of school studies, attended a school in Cranbrook, B.C. Consideration will be given to candidates recommended by the Board of School Trustees of School District No. 2, Cranbrook, B.C. Eligible students should apply by May 15th.

The British Columbia Hotels Association Scholarships—Six scholarships of \$250 each, the gift of the British Columbia Hotels Association, are offered to students who are residents of British Columbia and who are beginning or continuing studies in the Second, Third, or higher Year of University work. Selection of the winners will be made by the University on the basis of scholastic standing, personal qualities, and interest and participation in student and community affairs. In making the awards financial circumstances of the candidates may also be considered.

The Canadian Association of Geographers' Book Prize—An award will be granted annually to the graduating student who has specialized in geography and who has demonstrated the greatest proficiency in this subject.

The Canadian Women's Press Club (Vancouver Branch) Scholarship—This scholarship of \$250, offered by the Vancouver Branch of the Canadian Women's Press Club, is offered in competition to women students who are registered in the second or third year of university studies at the University of B.C. It will be awarded to a student who plans after graduation to follow a career in the field of journalism (newspaper, magazine, radio, television, etc.). Candidates must, by October 15th, complete the Undergraduate Application Form, and submit it to the Dean of Inter-Faculty and Student Affairs. The application must be accompanied by (1) a letter in which the candidate outlines her experience, if any, and interest in journalism, and her plans for a career in this field; (2) samples of the candidate's writing such as clippings, published articles, manuscripts and items contributed to school, college and community papers. Applicants will be considered on the basis of academic standing, personal qualities and character, and qualifications essential to success in journalism.

CBC Prize in Playwriting and Documentary Writing—A prize of \$500, donated by the Canadian Broadcasting Corporation, is offered in competition to winter or summer students in any faculty, graduate or undergraduate, who are attending the University and have registered for a full programme of studies leading to a degree. The prize will be offered to a student who has shown unusual promise as a playwright or documentary writer (film, television, radio, or stage). At the discretion of the judges, the prize money may be divided between two applicants, or withheld if no application of sufficient merit is received. Submissions must be original and must be designed to fill a half-hour programme or longer. The winning of the prize does not in any way obligate either the recipient or Corporation with respect to performance or production of the script. Submissions should be sent to the Chairman of the Creative Writing Department, Buchanan Building, no later than August 31st in any given year.

The D. F. MacKenzie Scholarship—A bequest from the late Donald Fraser MacKenzie provides scholarships to the total value of \$1000 annually. Under the terms of the bequest the University annually makes awards to one or two students proceeding into the Final Year of Arts, Science, or Medicine, the awards to be based upon academic standing and individual need, with preference in favour of deserving students proceeding to a career in theology or Medicine.

The Dilworth Prize in English—A book prize, to the value of approximately \$50, established by the late Dr. Ira Dilworth and augmented in honour of his memory by friends, will be awarded annually to the student who obtains the highest standing in Second Year English (English 200).

Dome Petroleum Ltd. Scholarship—A scholarship of \$500, gift of Dome Petroleum Ltd., Calgary, is offered to students in the B.Sc. programme and in engineering. In 1961 and 1962 the award was made to an outstanding student in the penultimate year of the Honours Course in Geology, in 1963 to a student in engineering (civil, mechanical, geological, or chemical). The award in 1964 was made in Geology, and, in 1965, in engineering. First or high Second Class standing is required.

Dr. MacKenzie American Alumni Scholarships and Bursaries—Six scholarships and/or bursaries of \$300 each are available for the academic year 1966-67, gift of the Friends of the University of B.C. Inc. to students who are residents of the United States in beginning or continuing studies at the University. Selections will be made on the basis of personal qualities, academic standing and promise. Preference will be given to candidates who are sons or daughters of U.B.C. Alumni. Application on the appropriate scholarship application form must be submitted to Dean Walter H. Gage, University of British Columbia, Vancouver 8, B.C., not later than May 31st.

Dr. Yun-I Ssu Memorial Prize—A prize of \$50, provided by the income from the Dr. Yun-I Ssu Memorial Fund established by friends of the late Dr. Yun-I Ssu (Ph.D. in Metallurgy, University of B.C., 1960), will be awarded to the overseas student of Chinese ancestry with the highest scholastic standing in a year preceding his or her final year in attendance.

The Elsie Black Lorimer Sclater Memorial Scholarship—This scholarship, established as a memorial to Elsie Black Lorimer Sclater by her husband, Captain John Sclater, New Westminster, is offered annually to students in any year and faculty at the University. In the amount of \$250, it will be awarded at the discretion of the University to a student with outstanding academic and personal qualities who is worthy and deserving of financial assistance.

The Ernestine A. M. E. Kania Memorial Scholarship—This scholarship of \$200, donated by Dr. and Mrs. J. E. Kania as a memorial to Dr. Kania's mother, Mrs. Ernestine A. M. E. Kania, is open to graduates or undergraduates for study and investigation in the field of geochemistry. The award will be made to a student with good academic standing and promise of ability in research. Selection of the winner will be made by the Scholarship Committee on the recommendation of Dr. H. V. Warren.

The E. V. Young Memorial Prize—This prize honours the memory of E. V. Young, who was highly esteemed for his contributions to radio and theatre in the fields of music and drama and is affectionately remembered by members of the University Musical Society in the years 1932-1954, not only for his professional skill, but also for his untiring efforts and his kindly and friendly encouragement. Donated by Dr. Maurice D. Young, this prize of \$50 will be awarded to an undergraduate who is taking his major work in Theatre at this University, who has good standing and has maintained an active interest in music or drama on the Campus. If, in any year, no student is sufficiently well qualified, the award will be withheld.

The Fern Cochrane James Scholarship—This scholarship of \$120, in memory of Fern Cochrane James, will be awarded annually to the woman student obtaining the highest standing in the First Year course in English.

The Frank de Bruyn Memorial Prize—As a memorial to their son, Frank de Bruyn, a prize of \$100 is offered annually by his parents. This prize will be awarded to the most promising student in 17th-century English literary studies, as at present covered by the courses English 370 and 375.

General Foods, Limited, Scholarships—These scholarships, gift of General Foods, Limited, with head offices in Toronto, are offered to students at the University of British Columbia in any first-degree course with outstanding academic and other qualifications. Each scholarship has the annual value of \$500. For attendance in the session 1966-67, one four-year award will be offered, and three previous awards will be renewed.

The Gilbert Tucker Memorial Prize—An annual prize of \$25 is offered by Dr. and Mrs. Sydney M. Friedman in memory of Gilbert Tucker (1898-1955), who served this University as scholar, historian and teacher. It will be awarded to the leading student in the field of the French in North America enrolled in History 531, 532, or 533.

The Guenther Felix Sanders Scholarships—These scholarships, provided by the income on a bequest from the late Guenther Felix Sanders, are available to students at the University of British Columbia, who are honouring or majoring in Mathematics or Applied Science and who are also the sons or daughters of members of the Knights of Pythias residing in British Columbia. Students must apply by May 15th on the appropriate scholarship form obtainable from the Dean of Inter-Faculty and Student Affairs, University of British Columbia. Basis of selection will be academic standing, but financial need may be a factor. Awards will be made on the recommendation of the University, in consultation with the Royal Lodge No. 6, Knights of Pythias, to the Trustees, whose approval is necessary and who are empowered to determine from time to time the amounts and conditions of these awards.

The Helen Badenoch Scholarships—A bequest from Ida Helen Badenoch provides annually two scholarships of \$300 each, one for the most proficient student in a field of public health, and the other for the most proficient student in a field of journalism or in a field related to journalism.

The Hewitt Bostock Memorial Lecture Prize—A prize of \$75 will be awarded for the best essay on the lecture given under the terms of the Hewitt Bostock Lectureship. The award is open to students in any year and faculty.

The H. R. MacMillan Scholarship—In honour of the outstanding contributions made to the Bank by H. R. MacMillan, Esq., C.B.E., D.Sc., LL.D., formerly a Vice-President and Director, Canadian Imperial Bank of Commerce has established a scholarship to enable employees to attend the University of British Columbia. Subject to satisfactory standing, the winner will receive \$1600 per annum in each year of his or her course. The winner will be selected by the University. To be eligible for consideration, an applicant must have a minimum of two years' service with the Bank and meet the admission requirements of the University. Applications should be forwarded to the Assistant General Manager, Personnel Division, Head Office, Canadian Imperial Bank of Commerce, Toronto, not later than March 1st.

The Imperial Order Daughters of the Empire Scott Memorial Scholarship—This scholarship of \$100, derived from an endowment founded by the Imperial Order Daughters of the Empire of the City of Vancouver, in memory of Captain Robert Falcon Scott, R.N., the Antarctic explorer, who sacrificed his life in the cause of science, will be awarded to a Third or Fourth Year student who combines high standing in Biology 334 with promise of service in the Commonwealth.

The International House Prize—A book prize will be awarded annually to the student of International House, University of British Columbia, who has made the greatest contribution to the aims and purposes of International House. Criteria in the selection will include initiative and ability in promoting activities, leadership, and academic qualifications.

The International Longshoremen's and Warehousemen's Union Undergraduate Scholarships—Four scholarships of \$250 each are offered to members, and sons and daughters of members, in good standing, of the International Longshoremen's and Warehousemen's Union. They are open to students in attendance at the University of B.C., the University of Victoria, or Simon Fraser University who will continue in a full programme of studies in the next session in an undergraduate faculty. These scholarships will normally be awarded to the candidates with highest standing as determined by the results of the Final Sessional Examinations conducted in April by the named universities. Candidates must notify the Dean of Inter-Faculty and Student Affairs, University of B.C., by May 1st of their intention of competing. The donors reserve the right to withhold awards if the academic standing of candidates is not sufficiently high or to re-award scholarships if winners receive other scholarships of substantial value.

International Nickel Scholarship—The International Nickel Company of Canada, Limited annually provides one scholarship to students entering the University of British Columbia for studies in Engineering, Geology, Geophysics, Mathematics, Physics or Chemistry, with preference being given to Mining or Metallurgical Engineering (when applicable). Awards are renewable for three additional academic years or until graduation, whichever is the shorter period, provided satisfactory standing is maintained. Valued at \$1,200 annually, each scholarship provides for tuition and fees, a \$300 living allowance, and a grant of up to \$500 to the University as a cost-of-education supplement.

The Jean Craig Smith Scholarship—The Jean Craig Smith Scholarship of \$500, provided by the income on a bequest from the late Jean McIntosh Smith, is awarded annually to a student in attendance at the University of

British Columbia in any year and faculty. Selection of the winner will be made on the basis of academic ability, character and personal qualities, participation in community and student affairs, and evidence of leadership.

J. K. Campbell & Associates Limited Scholarship—A scholarship of \$350, the gift of J. K. Campbell & Associates Limited (Edmonton, Calgary, and New Westminster) will be awarded to a student with an outstanding academic record who is continuing his studies in the following session.

The Joseph David Hall Memorial Scholarship—As a memorial to Joseph David Hall, a scholarship has been established by his parents, Mr. and Mrs. Joseph C. Hall. In accepting this award, the University pays tribute to a brilliant student, whose scholarship, sportsmanship, personal qualities, and courage in adversity won the admiration of all who knew him. In the amount of \$400, it will be awarded annually to a student beginning or continuing studies in a full course leading to a degree in any field. First preference will be given to a candidate nominated by the B.C. Division of the Canadian Paraplegic Association, but should no suitable nomination be received it will be awarded to a student with an outstanding academic record.

J. W. Gehrke Memorial Scholarship—This scholarship of \$100 will be awarded to a deserving undergraduate at the University of British Columbia.

The Kapoor Singh Scholarships—Through the generosity of the Kapoor Singh Siddoo Foundation, the amount of \$500 is offered annually for scholarships of \$250 each, for two students in attendance at this University. Of these scholarships, one will be available to an East Indian student, either from India or living in Canada, or to a Canadian of East Indian origin, and the other to the student body at large. The awards will be made to worthy students who (a) are deserving of assistance; (b) have high academic standing (with First Class Honours); and (c) have good character. If, in any year, no East Indian student can qualify, the scholarship money, or the residue thereof, will be placed in a trust fund and will be granted in the succeeding year or years to one or more East Indian students in the amount of \$250 or more.

The Karen Elaine King Memorial Scholarship—This scholarship is given by Mr. and Mrs. F. E. King of Calgary in memory of their daughter, Karen Elaine, who attended this University in the session 1959-60. In the amount of \$350, it will be awarded to a student who is outstanding with respect to personal qualities and academic record, and who is worthy and deserving of financial assistance. This scholarship is open to students who have completed the First Year of studies in a full programme leading to a degree and are continuing in the next higher year.

The Macmillan Company of Canada Prizes in Creative Writing—Two prizes of \$100 each, the gift of the Macmillan Company of Canada, Publishers, will be awarded for the best original short story and the best original poem, respectively, written by an undergraduate or graduate student while enrolled in the University. The awards will be made on the recommendation of the Head of the Creative Writing Department, in consultation with the Committee on Prizes and Scholarships. Entries must be submitted to the Head by April 1st.

The Mary Stewart MacInnes Memorial Scholarship—A scholarship of \$300, established by W. H. MacInnes, Esq., of Vancouver, in memory of his mother, Mary Stewart MacInnes (1841-1936), is offered annually to a student in the Faculty of Arts, Applied Science, Agriculture, Forestry, or

Science, who is completing the third of the first three years of University work. In choosing the winner, consideration will be given, not only to scholastic standing but also to achievement in the field of student government and in athletics, and either to participation in military or other training or service units on the campus or to special interest in German studies.

The Mrs. H. R. MacMillan Scholarship and Bursary Fund—The annual income from a bequest by Mrs. H. R. MacMillan provides scholarships and bursaries to enable deserving women students with good academic standing to begin or continue attendance at the University of B.C. In making awards the Scholarship Committee of the University will give special preference to those whose circumstances make it necessary to be self-supporting.

The Nancy Ryckman Scholarship—Out of the proceeds of a fund bequeathed to the University by the late Nancy E. Ryckman, a scholarship of \$350 will be awarded annually to a student beginning or continuing a course of study at the University. This scholarship will be available only to students who have completed Senior Matriculation and who attended school in East Kootenay, British Columbia, for three years, of which two years must have been immediately prior to entrance to the University. It is the expressed wish of the donor that the scholarship be awarded to young men or women who require aid in obtaining a university education and that, in making the award, consideration be given to character and intellectual promise. Applications, on forms available at the office of the Dean of Inter-Faculty and Student Affairs, must be received not later than May 31st.

The Nisei Varsity Club Scholarship—A scholarship of \$100, the gift of the Nisei Varsity Club, is offered to members of the Nisei Varsity Club. It will be awarded to a student who has completed at least one year at the University of British Columbia and is proceeding to further undergraduate studies towards a degree. Selection of the winner will be made by the University, after consultation with the Club, on the basis of academic standing, character and contributions to club activities. Those who desire to be considered for this award or to nominate candidates should get in touch with the Dean of Inter-Faculty and Student Affairs not later than April 30th.

The Joseph A. Crumb Book Prize—A book prize, established by the students and friends of Professor Joseph A. Crumb, will be awarded annually to the student who obtains the highest standing in the undergraduate course in money and banking (Economics 308).

The Rayonier Canada (B.C.) Limited Special Scholarship—A scholarship of \$500, the gift of Rayonier Canada Limited, is offered annually to sons and daughters of employees of the Company in attendance at the University. The award will normally be made to the student obtaining the highest standing in the First Year of University work and proceeding to further undergraduate study. If, in the opinion of the University, however, no student in the First Year obtains sufficiently high standing, the scholarship will be similarly offered to an eligible student in the Second, Third, Fourth and higher years, in that order. Candidates who are eligible for this award should submit their names and details of family service with the Company to the Dean of Inter-Faculty and Student Affairs not later than April 30th.

The Retail Food and Drug Clerks Union, Local 1518, Scholarships—The Retail Food and Drug Clerks Union, Local 1518, offers three scholarships of \$350 each to students beginning or continuing studies in a full academic programme of studies at the University of B.C., University of Victoria, or Simon Fraser University. The awards will be made to the applicants with

the highest standing in the final examinations. Students entering from Grades XII or XIII must write a full set of examinations conducted in June by the Department of Education. To be eligible a candidate must be a member, or the son, daughter, or legal ward of a member of the Union in good standing. Those who wish to be considered must give full details of their own or their parents membership in the Union. Applications must be made on the appropriate Application Form for Scholarship, which may be obtained from, and must be returned to, the Dean of Inter-Faculty and Student Affairs, University of B.C. The last day for receiving applications is June 1st.

The Ruth E. Cameron Memorial Scholarship—As on page 85.

The Scandinavian Businessmen's Club Scholarship—The Scandinavian Businessmen's Club offers a scholarship of \$250 to a student of Scandinavian (Danish, Icelandic, Finnish, Norwegian or Swedish) parentage on the paternal side, continuing studies at this University toward a degree in science or engineering. The winner will be selected by the University on the basis of academic standing and with some consideration of the need for financial assistance.

The Sherwood Lett Memorial Scholarship—To honour the memory of the late Chief Justice Sherwood Lett, C.B.E., D.S.O., M.C., E.D., Q.C., B.A., LL.D., an annual scholarship, at present in the amount of \$1500, has been endowed by alumni, faculty and staff, students, colleagues, and friends. Open to students, both men and women, in attendance at this University, this scholarship pays tribute to an outstanding graduate who rendered distinguished service to the University, to his profession and, both in war and peace, to his country. It will be awarded annually to the candidate who most fully displays the all round qualities exemplified by the late Sherwood Lett. The selection will be made, by a special committee, from candidates nominated by faculties and designated student organizations. In assessing the merits of candidates, this committee will be concerned with qualifications such as those for which Sherwood Lett was distinguished—high scholastic and literary attainments, physical vigour (through active interest in sports), moral force of character, and ability to serve, work with, and lead others. Full details are given in a brochure which may be obtained from the Dean of Inter-Faculty and Student Affairs.

The S. M. Simpson Memorial Scholarship—A scholarship of \$100, established in 1960 by employees of S & K Limited, Plywood Division, to honour the memory of the late S. M. Simpson, is offered annually to any male or female student, resident in School District No. 23 (Kelowna, Rutland, Westbank, Winfield), who is proceeding directly from Grade XIII or First Year University to a full programme in Forestry at any Canadian University. Candidates who wish to be considered should apply by letter to be received by Dean Walter H. Gage, University of B.C., Vancouver 8, B.C., not later than June 30th.

The Sons of Norway Scholarships—The British Columbia Sons of Norway offer three scholarships of \$300 each to students attending a University in British Columbia and proceeding to the second final or the final year of a full programme leading to a degree. To be eligible a candidate must be (a) a member of a British Columbia Sons of Norway Lodge, or (b) the son or daughter of a member of such a Lodge. Application must be by letter, addressed to the Sons of Norway Scholarship Committee, c/o Dean Walter H. Gage, University of B.C., Vancouver 8, B.C. The letter of application must (1) indicate the applicant's eligibility with respect to (a) or (b) above, together with a receipt from the secretary of the Lodge concerned; (2) give details of the

applicant's course of study, reasons for applying, and future plans for a career; (3) be accompanied by official transcripts of the applicant's high school and University records. The applicant must also arrange for one or more confidential testimonials to be forwarded, preferably from faculty members acquainted with the applicant's character and personal qualities, interests, and ability as a student. Applications must be submitted by August 1st. Successful applicants will be chosen by a special Committee.

The T. E. and M. E. Ladner Memorial Scholarship—An annual scholarship of \$550, derived from a capital sum as a permanent memorial endowment, and given by Mr. Leon J. Ladner, Q.C., and family in memory of his parents, Thomas Ellis and Minnie E. Ladner, is offered to a student whose home is in Delta Municipality of the Lower Fraser Valley. To be eligible for this scholarship an applicant must have high scholastic standing. In making the award, however, consideration will be given to character and financial need. The scholarship is open to students who are eligible for entrance to and will attend the University or are in any year of any faculty. If, in any year, no applicant can meet the scholastic requirements of the University, the award may be withheld. In such case, two awards will be made in a subsequent year. Applications, on forms available at the office of the Dean of Inter-Faculty and Student Affairs, must be received not later than May 15th.

The Thea Koerner Memorial Scholarship—A scholarship of approximately \$500, established by her friends in memory of Thea Koerner and in recognition of her most generous encouragement of the arts at the University and in British Columbia, will be awarded annually, upon the joint recommendation of the Departments of Fine Arts, Music and Theatre, to a full-time student regularly enrolled in one of these Departments and proceeding to a degree, whose past performance and future promise qualify him as the most suitable recipient of the award.

Theta Chapter of Phrateres Scholarship—A scholarship of \$50, established by Theta Chapter of Phrateres, will be awarded to a member of the organization who, during the session, has attained good academic standing and who, by her active participation and qualities of leadership, has made an outstanding contribution to Phrateres. Candidates will be nominated by Phrateres. The winner will be selected by the University. The winner will not be precluded from holding other awards.

The Thomas and Evelyn Hebb Memorial Scholarship—In recognition of the part played in the development of this University by Professor Thomas Carlyle Hebb, until his death, and by his wife, Evelyn Hebb, herself a distinguished scholar, and in commemoration of their interest in the progress of students, their son and daughters have endowed a scholarship of the value of \$450 per annum, open to students of any faculty who are specializing in Physics. The award will be made, on the recommendation of the Department of Physics, to a student in the upper undergraduate years or in the graduate school who has an outstanding academic record, desires to proceed with further work at this University, and shows promise of continuing ability in his chosen field. If the award is made at the undergraduate level, it may be divided between two candidates of equal merit.

The Thorleif Larsen Memorial Scholarship—This scholarship of \$100, established in honour of Professor Thorleif Larsen, a member of the English Department of the University of British Columbia from 1919 to 1958, will be awarded annually to the leading student in English 200.

The Tri-Services University Training Scholarships and Prizes—Three scholarships of \$200 each, established by the trustees of the Combined

University Services Trust Fund, are offered to students undertaking reserve officer training in each of the University Naval Training Division, The Canadian Officers Training Corps and the RCAF Reserve University Squadron at the University of B.C. To be eligible for the awards candidates must have completed at least the first phase of their practical and theoretical training with their respective services and be proceeding with their university studies. Winners will be selected by the Scholarship Committee of the University in consultation with Commanding Officers of the units, on the basis of academic proficiency and on qualities of leadership as exhibited in the service training programmes. The financial circumstances of candidates may, however, also be considered. If no candidate is considered to be sufficiently well qualified the awards may be withheld. Similarly, based on the criteria mentioned above a prize to the value of \$50 may be awarded to an officer cadet in each of the campus service units who is a member of the regular Navy, Army and Air Force and attending the University of B.C. under the auspices of the Department of National Defence.

U.B.C. Branch No. 72 of the Canadian Legion, B.E.S.L., Scholarship Fund—This fund was established in September, 1951, by the University of British Columbia Branch No. 72 of the Canadian Legion of the British Empire Service League, in recognition and appreciation of the University's contribution to the education and rehabilitation of veterans of World War II. By agreement between the University and West Point Grey Branch No. 142 (which undertook to act for Branch No. 72 when it disbanded), the University makes an annual grant, administered by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries, to provide scholarships, prizes, bursaries, and loans for former members of the armed forces or their dependents. Special preference is given to the children of those killed or wounded in action, and to service disability pensioners generally. In the event of there being no applicants with the above qualifications, awards may be made to members of the student body at large.

The United Nations Prize—A prize of \$50, made possible by a gift of \$1000 from the late Annie Bruce Jamieson, B.A., LL.D., is offered annually to the student on the campus who, during the session, makes the most significant contribution toward furthering an understanding of the aims and objects of the United Nations. If, in any year, no student qualifies, the award may be withheld.

The University Essay Prize—A book prize of the value of \$25 will be awarded to a student in the final undergraduate year for the best essay presented in any of the courses regularly given by the Department of English.

University Great War Scholarships—Two scholarships of \$200 each may be awarded, on the basis of the work of the First Year in Arts, Science or Agriculture, to ex-servicemen, their dependents, and the children of deceased ex-servicemen, proceeding to a higher year in any faculty.

The Vancouver Natural History Society Prize—A prize in the form of a book to the value of \$25, the gift of the Vancouver Natural History Society, is offered to the best student in Fourth Year Botany.

The Vancouver Police Force Scholarships—As on page 91.

The Vancouver Secondary Women Teachers Scholarship—As on page 42.

The Victoria Daily Times Prize—A prize of \$100, offered annually by the Victoria Daily Times, is available in competition to students proceeding to a degree. The prize will be awarded for the best piece of writing published, or

prepared for publication, during the year for the mass-media field, including the student paper on the campus. In judging the submissions the Selection Committee will consider, not only content, style, originality, and creativeness but also promise of development. Nominations or applications for the award must be received by the Dean of Inter-Faculty and Student Affairs not later than March 1st, and must be accompanied by the material which the Selection Committee is to consider.

The W. H. MacInnes Scholarship in Greek—This scholarship, in the amount of \$250, the gift of Mr. W. H. MacInnes of Vancouver, will be awarded annually to the outstanding student completing Greek 200 who is continuing undergraduate studies in a programme including an advanced course or courses in Greek.

The William Eugene MacInnes Memorial Scholarship—A scholarship of \$300, established by Mr. and Mrs. W. H. MacInnes of Vancouver, in memory of their son, William Eugene MacInnes (1912-1934), a graduate of this University in a combined course of Arts and Science and Mining Engineering, is available annually for a student in Arts, Science or Applied Science who is completing the third of the first three years of University work. In choosing the winner, consideration will be given, not only to scholastic standing, but also to achievement in student government and in athletics, and to participation in military or other training or service units on the campus.

The Women's Big Block Club Scholarship—A scholarship of \$100, the gift of the Women's Big Block Club, will be awarded annually to a Club member continuing studies at this University. The award will be made to a woman student who is an active member of the Women's Big Block Club, has good academic standing and participates actively in campus athletics.

In Agriculture

The A. J. Mann Scholarship in Horticulture—This scholarship of \$100, established by Mrs. Arthur J. Mann to honour the memory of her husband, is offered annually to students continuing their studies at the University of British Columbia in the field of horticulture. It is open to any student entering this field, but first preference is given to students who are graduates of Summerland Secondary School. Although the scholarship is available to students proceeding to a higher year, preference will be given to a student entering the First Year. The award will be made on the recommendation of the Faculty of Agriculture.

The Boulton Prize—A book prize of \$25, the gift of Mr. H. N. Boulton, is offered for award in the Division of Animal Science to a promising student in this field of work.

The British Columbia Fruit Growers' Association Golden Jubilee (1939) Scholarship—This scholarship, of the annual value of \$250, donated by the British Columbia Fruit Growers' Association, will be awarded to a student taking the horticultural options of the Third Year. To qualify for this scholarship candidates must obtain scholarship standing, not only in horticultural subjects, but also in the work of the year, and must be proceeding to the horticultural course of the Fourth Year—the year in which the scholarship shall be enjoyed.

The David Thom Scholarship—A scholarship in Agriculture of \$150 will be awarded to a student proceeding to a higher year in that Faculty, the award to be based on the work of the Second Year.

The David A. McKee Scholarship—A scholarship of the annual value of \$225, established by a bequest from the late Dr. D. A. McKee, will be awarded to a student in Agriculture with high standing.

The Dean B. A. Eagles Book Prizes—These prizes are awarded annually for outstanding achievement in the essay and other requirements, and for leadership, in the course Agriculture 300 (Field Trip).

The Dr. D. A. McKee Memorial Prize—A cash prize of \$50 established from the income of a trust fund donated by the late Mrs. D. A. McKee in memory of her husband, will be awarded annually to the student with the highest standing in the Third Year of Agriculture who is proceeding to the Fourth Year.

The Dr. G. F. R. Barton Memorial Scholarship—In recognition of the private friendships, public service, and contributions of Dr. G. F. R. Barton in the field of veterinary science, this scholarship-bursary of \$100 was established and endowed in July, 1958, as a memorial by his friends in the Chilliwack area. It will be awarded annually to a British Columbia student who has good standing in the First Year of the pre-Veterinary course at the University and is proceeding to the next year. In making the award, consideration will be given to the financial circumstances of eligible candidates. Applications must be submitted by April 30th.

The Gillmor and Roderick Morrison Memorial Scholarship—This scholarship, of annual value of \$100, was established and endowed by Mr. and Mrs. A. B. Morrison as a memorial to their sons, Gillmor Innis Morrison and Roderick Norman Morrison, who attended the University during the session 1929-30. This scholarship will be awarded annually to a student in the Faculty of Agriculture who has shown proficiency in the Third Year in the field of genetics and is continuing his studies in the Final Year.

Hoffmann-La Roche Prize in Animal Nutrition—A prize, the gift of Hoffmann-La Roche Limited, Montreal, will be awarded for the best graduating essay or Master's thesis in the field of Animal Nutrition. The award will be made on the recommendation of the Dean of Agriculture.

The Nabob Scholarships in Food Technology—Two scholarships of \$500 each are given annually by Nabob Foods Division of Kelly, Douglas & Co. Limited, Vancouver, to students in the Faculty of Agriculture. One of these scholarships will be open to students entering the Third or the Fourth Year of the course in Food Technology and the other will be open to students completing the Fourth Year of the course in Food Technology and proceeding to the Fifth Year. To be eligible for these scholarships the recipients must have high standing and indicate special interest in this highly important field. They will be selected on the basis of scholarship, research ability and personal qualities. If no student qualifies for one of these awards they may both be given to students in the same year of the course. During the summers between successive years of their undergraduate course the winners will be given the opportunity of employment with the Company, which offers the possibility of an attractive career on graduation. Students interested in being considered for these awards should consult the Dean of Inter-Faculty and Student Affairs not later than March 1st. Dependents or relatives of employees of the Company are specially invited to apply.

The Stanford and Iris Wainwright Memorial Scholarship—This scholarship, endowed by Iris Violet Wainwright in memory of her husband, Stanford Wainwright, serves to recognize his general interest in the field of agriculture and his special interest in the breeding of Jersey cattle. In the amount

of approximately \$150 annually, it will be awarded to a student in the Third or a higher year of Agriculture who has good academic standing and is pursuing studies or research in the selection or breeding of dairy cattle.

University Scholarship in Agriculture—A scholarship in Agriculture of \$200 will be awarded to a student proceeding to a higher year, the award to be based on the work of the First Year.

The Walter and Elizabeth Highmoor Prize—To honour the memory of his parents, Walter and Elizabeth Highmoor, and to mark the contributions which they have made to community life in British Columbia, this prize has been established by Claude Kendall Highmoor, 57 Anglesey Boulevard, Islington, Ontario. In the amount of \$25, it will be awarded annually to a male student who has an outstanding record in agriculture or animal husbandry.

Western Vinegars Centennial Scholarship (donated by Cerebos (Canada) Limited)—This scholarship of \$1,000 is offered annually in competition to undergraduates who have completed the first two years of the course leading to the degree of Bachelor of Science in Agriculture and are continuing in the Third Year of the programme in this Faculty. It is open to students who, after graduation, propose to engage in careers related to production agriculture. In selecting the winner, the Faculty of Agriculture will consider the candidates' academic standing, interest in a career in agriculture, character, and qualities of citizenship.

In Architecture

The Architectural Institute of British Columbia Scholarship—A scholarship of \$250, the gift of the Architectural Institute of British Columbia, will be available to a student entering First Year Architecture. The award will be made to the student entering with the highest marks as determined by the average on the written examinations of Arts and Science at the University of British Columbia. To students of the Institute other assistance may be available from the Institute to assist them to attend the First Year in Architecture at the University of British Columbia.

The Architectural Institute of British Columbia Prizes—Prizes to the total of \$200, given annually by the Architectural Institute of British Columbia, are available for leading students in any year of Architecture. These prizes, which consist of books and an award of merit, will be awarded to the student in any year showing outstanding ability in architectural design and obtaining high academic standing. If, in any year, no student obtains a sufficiently high standing, the awards may be withheld.

The British America Paint Co. Ltd. Scholarships in Architecture—Two scholarships of \$500 each, the gift of British America Paint Co. Ltd., with British Columbia offices in Victoria and Vancouver, are offered to students of architecture at this University. One award is offered to students who are entering the final undergraduate year of the course leading to the degree of B. Arch. and the other to students entering the second to last year. The scholarships will be awarded to the students with the most outstanding over-all records in the previous year. Winners are not permitted to hold other scholarships.

The Canadian Pittsburgh Industries Scholarship—A scholarship to the value of \$250 will be awarded annually by Canadian Pittsburgh Industries Ltd., to a student in the Second Year of Architecture. The award will be made to the student submitting the best solution of an architectural problem

proposed by the Staff of the School of Architecture in conjunction with the Company. The award will be made on the recommendation of the School.

The McCarter, Nairne & Partners Scholarship—A scholarship of \$400, provided by a gift from McCarter, Nairne & Partners, Architects, will be awarded annually to the student in Second Year Architecture obtaining the highest standing.

Northwest Plaster Bureau Scholarship—A scholarship of \$250 is offered by the Northwest Plaster Bureau to the student, entering the Final Year, who is considered by the faculty of the School of Architecture to be outstanding in his or her progress towards the profession of Architecture and devotion to good practices in building design and construction, and who indicates that he or she proposes to continue in the profession of Architecture after graduation.

Pan-Abode Scholarship in Architecture—A scholarship of \$500, the gift of Pan-Abode Buildings Ltd., is offered annually to a student entering Final Year of the course leading to a degree of B.Arch., who received one of the highest aggregate standings in the previous years of the course and shows outstanding promise in his future professional career.

Vancouver Hoo Hoo Club Scholarship Grant—The Vancouver Hoo Hoo Club offers an annual scholarship of \$500 to a selected student in the School of Architecture, either in the final year of the undergraduate programme or in the graduate programme, provided his studies are directed towards furthering the understanding and knowledge of wood in architecture. If, at the discretion of the faculty, no grant is given in a particular academic year, the monies may accumulate for that one year only.

In Arts

The Alan Boag Scholarship—As on page 17.

The Beverley Cayley Scholarship—A scholarship of \$100, in memory of Beverley Cayley, Arts '18, given under the terms of the will of his mother, the late Mrs. H. S. Cayley, will be awarded to the male student standing highest in English 100 in the First Year of the Faculty of Arts or Science.

The Brissenden Scholarship—A scholarship of \$350, given by P. R. Brissenden, Esq., Q.C., is offered in alternate years to a student of the University of British Columbia, graduate or undergraduate, who has shown promise as a creative writer and who is returning to the University. The next award will be made on the basis of work taken in the session 1965-66.

The British Columbia 1958 Centennial Scholarship—This endowed scholarship is offered annually to students who are residents of British Columbia and are continuing undergraduate studies in the field of the humanities or social sciences. In the amount of \$500 annually, it will be awarded to a student entering the Third Year with an outstanding academic record. In the selection of the winner, the general interest and participation of candidates in University and community affairs may be a factor.

British Columbia Hydro and Power Authority Undergraduate Scholarship in the Social Sciences and Humanities—A scholarship of \$250 is offered by British Columbia Hydro and Power Authority to students in the Third Year of the Faculty of Arts. Selection of the winner will be made by the Scholarship Committee, from students in the field of the Social Sciences and Humanities.

The Canadian Forest Products Ltd. Scholarships in Arts—Two scholarships of \$200 each, the gift of Canadian Forest Products Ltd., are offered to students in the Faculty of Arts who are proceeding to the Final Year. Awards will be made on the basis of proficiency, but preference will be given to students in Economics.

The Carroll Aikins Prizes in Buddhist Studies—Two prizes, a first prize of \$50 and a second prize of books to the value of \$25, are offered annually for an essay in the field of Buddhist studies. Students, to be eligible, should be currently registered in or have successfully passed at least one course involving studies in Buddhism.

The Daniel Buchanan Scholarship in Mathematics—As on page 72.

The David and Blanche Gwynne-Vaughan Memorial Scholarship—A scholarship of \$100, given by Mrs. S. J. Bateman of Chilliwack as a memorial to her parents, David Edward and Eva Blanche Gwynne-Vaughan, will be awarded annually to a promising and deserving student who is continuing studies in Second or Third Year at this University and who proposes, either before or after graduation, to proceed to work in theology at the Anglican Theological College of British Columbia. In awarding this scholarship, consideration will be given not only to academic achievement, but also to personal qualities and character. Application by letter must be submitted by May 1st.

The David Bolocan and Jean Bolocan Memorial Prize—A prize of \$25, given by Mr. J. L. Bolocan, Edmonton, Alberta, in memory of his wife Jean and son David, will be awarded to the student in the Final Year of the Faculty of Arts who is regarded by the Departments of Philosophy and Psychology as the outstanding student in these departments in the graduating year.

The Dr. Isabel MacInnes Prize—In honour of Dr. Isabel MacInnes and in recognition of her qualities as a teacher and of her services to the University, a prize of \$100 is offered to a student in German 200, 210, 223, or 230. The award will be made on the basis of standing and progress in the course.

The Dr. William Rose Award—This prize of \$150, gift of the Canadian Polish Congress, British Columbia Branch, will be awarded to two students, each to receive a gift of \$75, when both have an outstanding record of achievement in the course Polish 110. When only one student qualifies the student is to receive the full sum of \$150. Preference will be given to a student who took the course without any previous knowledge of Polish.

The Dukowski Family Scholarship Grant—This scholarship of \$100, the gift of Mr. and Mrs. A. Dukowski of Vancouver, will be awarded to a deserving student of Polish Language or Literature who shows promise of ability for independent work in one of these fields.

The East Asia Society Scholarship—Through the efforts of the East Asia Society, this scholarship of \$100 has been established for students entering Third or Fourth Year Arts and taking honours or majors in the Department of Asian Studies. To be eligible an applicant must have an overall average of at least 75% in the work of the year. The scholarship will be awarded to the eligible candidate with the highest combined standing in one Asian language course and one other Asian Studies course.

The English Honours Medal—This medal will be awarded annually at the Spring Congregation to the outstanding graduate of the year in English Honours. The decision as to whom the medal shall be given will be made by

the members of the English Honours Committee, who shall reach their decision on the basis of the student's overall record in his senior years of study. Students in combined and double honours, as well as in single honours, will be eligible. The basic reasons for the establishment of the award are to grant particular recognition to exceptional achievements in the field of English studies at the undergraduate level and to encourage continuing studies in the humanities.

English Honours Prize—Through the generosity of Dr. and Mrs. Wallace Wilson, an annual prize of \$300 will be awarded to the winner of the English Honours Medal in that year.

The German Government Book Prizes—These book prizes, the gift of the Federal Republic of Germany through the Consulate in Vancouver, are available for students in the upper years showing proficiency in German.

The Italian Scholarship—This scholarship of \$180 will be awarded annually to an undergraduate of outstanding ability specializing in Italian.

The John and Annie Southcott Memorial Scholarship—As on page 10.

The KVOS-TV Scholarships—A scholarship or scholarships to the total of \$200, the gift of KVOS-TV, are offered in the Faculty of Arts. These scholarships will be awarded to students in the field of the humanities or the social sciences, with preference being given to those who have a special interest in journalism, communication, or related areas of study.

The Mabelle Andison Scholarship Fund—As a memorial to Mrs. J. G. Andison and as a tribute to her fine personal qualities and her outstanding service to the Community, this fund has been established by her friends. It will be used to provide awards, from time to time, for students in the field of French Language and Literature who have high scholastic standing or who show promise and are deserving of financial assistance.

The McGill Graduates' Scholarship—A scholarship of \$125, founded by the McGill Graduates' Society of British Columbia, will be awarded to the student standing highest in English and French of the Second Year in Arts and proceeding to a higher year.

The Morris Belkin Prize—A cash prize of \$100, the gift of Morris Belkin, Esq., is available for students specializing in psychology and registered in graduate studies or the senior undergraduate year. It will be awarded for the best essay submitted in courses given by the Department on an approved subject in the field of Freudian Psychology. Further details may be obtained from members of the Department, on whose recommendation the award will be made. If no essay reaches a sufficiently high standard, the award may be withheld.

The Prizes of the Ambassador of Switzerland—These book prizes will be awarded in the session 1966-67 to an outstanding student of French Language and Literature and to a student with high standing in German.

Royal Institution Scholarship in Arts—A scholarship of \$200 will be awarded to the student taking first place in the examinations of First Year Arts and proceeding to a higher year in any faculty.

Scholarship in Economic Geography (donated by the Canadian Transport Co. Ltd.)—This scholarship of \$100 is available for Third Year students in Arts who are taking Honours or majors in Geography, or for Third Year students in Commerce (Foreign Trade option) with elective subjects in

Geography. The award will be made to a student who has obtained high standing in Geography 201 (Economic Geography) in his Second Year, and has the highest aggregate standing in the Third Year of Arts or of Commerce in six units chosen from Upper Year Geography courses.

The Shaw Memorial Scholarship—This scholarship of \$130, founded by friends of the late James Curtis Shaw, Principal of Vancouver College, and afterwards of McGill University College, Vancouver, will be awarded upon the results of the examinations of the Second Year in Arts to the undergraduate student standing highest in any two of three courses, English 200, Latin 200 or 210 or 220, Greek 100 or Greek 200, and proceeding to a higher year.

The Slavonic Studies Graduation Prize—This prize of \$100, the gift of Walter C. Koerner, Esq., in honour of Dr. William J. Rose, will be awarded annually to the student in the graduating class obtaining highest standing in Slavonic Studies.

The Terminal City Club Memorial Scholarship—This scholarship of \$100, founded by the members of the Terminal City Club as a memorial to those members of the Club who lost their lives in the Great War, will be awarded to the student standing highest in English 200 and Economics 100 or 200 or 202 in the Second Year in Arts, and proceeding to a higher year.

The Undergraduate Scholarships in Slavonic Studies—Through the generosity of Walter C. Koerner, Esq., several scholarships have been established in honour of Dr. William J. Rose, distinguished Canadian scholar and teacher, and Emeritus Professor of Polish Language and Literature, University of London. Included in the awards offered are:

(1) an annual scholarship of \$300 for a student with high over-all standing who has shown special distinction in the course Slavonics 310 and is continuing his studies in this and related fields;

(2) an annual scholarship of \$250 for the student obtaining the highest standing in the Third or Fourth Year of an Honours Course in Polish, Russian or Slavonic Studies and proceeding to the Final Year of the course.

(3) two annual scholarships of \$250 each for students in the Second Year who have high over-all academic standing, have shown special linguistic aptitude in one or more of the courses Polish 210 or Russian 200 or 203, and are continuing in the Third Year in Slavonic language studies.

University Scholarship in Arts—Scholarships of \$200 each will be awarded to the student obtaining highest standing in the Third Year, the student obtaining highest standing in the Second Year, and the student obtaining second highest standing in the First Year.

The Vancouver Women's Canadian Club Scholarship in Canadian History—A scholarship of \$100, the proceeds of a fund created by the Vancouver Women's Canadian Club, will be awarded to the undergraduate obtaining first place in Canadian History (History 202, 326, 329).

The Wallace and Ethel Wilson Scholarship—An annual scholarship of \$1200, established through the generosity of Dr. and Mrs. Wallace Wilson, will be awarded to a student of high academic standing and with promise of distinction, nominated by the Department of English and entering the final year of the Honours English programme.

In Commerce and Business Administration

The B.C. Association of Real Estate Boards Mary Simpson Scholarship—A scholarship of \$250 annually, the gift of the Realtor Division of the Real Estate Institute of British Columbia, is offered to an undergraduate or graduate student in Commerce and Business Administration who is taking the Real Estate programme, has high academic standing and is deserving of assistance to further his education. The award will be made on the recommendation of the Faculty.

The British Columbia Bond Dealers' Association Scholarship—A scholarship of \$150, the gift of the British Columbia Bond Dealers' Association, will be awarded annually to a student in the finance option completing Second Year Commerce and proceeding to the Third Year. The award will be made to a student who has high scholastic standing and has shown an aptitude for work in the field of this option.

British Columbia Hydro and Power Authority Undergraduate Scholarships in Commerce and Business Administration—Two scholarships of \$250 each are offered by British Columbia Hydro and Power Authority to students in Commerce and Business Administration. One scholarship is open to students who, in the fall, will proceed to the Final Year, and the other to those who will proceed to the Third Year. Selection of winners will be made by the Scholarship Committee in consultation with the Faculty.

The Canadian Forest Products Ltd. Scholarships in Commerce—Two scholarships, one of \$250 and the other of \$200, the gift of Canadian Forest Products Ltd., are offered to students in Commerce and Business Administration who are proceeding to the Final Year. They will be awarded on the basis of proficiency.

Chadwick, Potts & Company Scholarship—A scholarship of \$100, the gift of Chadwick, Potts & Company, Chartered Accountants, is awarded annually to the student in the combined programme for C.A. and degree of B.Com. who obtains the highest general academic standing in the nine units of University subjects for the year.

The Clarkson, Gordon & Co. Research Assistant Award—An award of \$250 is offered annually by Clarkson, Gordon & Co., Chartered Accountants, to a student entering the Fourth Year of the accounting option. The award will be made on the recommendation of the Faculty of Commerce and Business Administration, consideration being given to character, industry, and the general academic record of the student. During the tenure of this award, the student will be required to render assistance to members of the accounting staff on research being carried on by them.

The Clarkson Prize in Accounting—A prize of \$100, the gift of Clarkson, Gordon & Co., Chartered Accountants, will be awarded annually to the student in the accounting option who obtains the highest mark in Commerce 252 (Intermediate Accounting). To be eligible for this award, the student must also obtain above average standing in his other courses.

Clarkson, Gordon and Co. Service Award—The service award will be given to a student in Third Year Commerce who is proceeding to the Fourth Year and who intends on graduation to enter articles with a firm of Chartered Accountants. The student's tuition will be paid in his final year of Commerce and ordinarily he will be given employment with Clarkson, Gordon and Co. for the summer. The award will be made to a student whose academic ability and record are, in the opinion of the Faculty, those needed by a successful chartered accountant.

The Elmer Johnston Memorial Scholarship—A scholarship of \$250, donated by the Automotive Transport Association of B.C., will be awarded annually to the student in Commerce who obtains the highest standing in the course on transportation practices and policies (Commerce 341) and is proceeding to the course in Motor Highway Transport Problems (Commerce 446).

The Finning Tractor & Equipment Co. Ltd. Scholarships—As on page 47.

Gill Interprovincial Lines Limited Scholarship—A scholarship of \$250, gift of Gill Interprovincial Lines Ltd., is offered annually to students in Commerce and Business Administration. This scholarship is open to students who are completing the Third Year and are proceeding to the Final Year, who have outstanding academic records, and are specializing in finance, or economics and political science. The winner will be selected by the Faculty on the basis of academic standing, personal qualities and promise. During the Final Year the recipient will be required to undertake study, investigation or research in an area related to the field of highway transportation.

The Graduating Class of 1958 Memorial Shields—As a memorial to two of their classmates, the members of the Graduating Class of 1958 have donated the Matthew H. Henderson Memorial Shield and the Dorothy Anne Dilworth Memorial Shield; the first to be awarded annually to the outstanding man student, and the second to the outstanding woman student, in the graduating class. The awards will be made by the Faculty on the basis of academic standing, personal qualities, and contributions to the Commerce Undergraduate Society and other campus activities.

The Grant Industries Service Award—This scholarship, provided by Grant Industries, a division of Eddy Match Company, Limited, is offered to male students in Commerce who, in the fall, will continue their studies in the Final Year of a B.Com. programme. It is open to students majoring in marketing, and interested in fields such as marketing and research. The winner, selected by the Faculty of Commerce in consultation with the Company, will be given employment by the Company in the summer and tuition fees for the Final Year. Interested students should consult the Faculty early in January. The first award will be made in 1967.

Granville Mayall Memorial Scholarship—This scholarship of \$250 has been established by the friends of the late Granville Mayall with the assistance of the Automotive Transport Association of B.C. The scholarship is offered annually to graduate or undergraduate students in Commerce and Business Administration. It is awarded on the basis of academic standing, personal qualities and interest in the field of transportation. It is expected that the student will undertake a paper in the area of transportation.

H. A. Roberts Scholarship—A scholarship of \$200, gift of H. A. Roberts Ltd., is offered to a student in Commerce and Business Administration who is taking the Real Estate programme, has high academic standing, and is deserving of assistance to further his education. The award is to be made on the recommendation of the Faculty and preference is to be given to a former student of Britannia High School, Vancouver.

The Harold A. Jones Memorial Scholarship (donated by Vancouver Tug Boat Co. Ltd.)—As a memorial to Harold A. Jones, President of Vancouver Tug Boat Co. Ltd. from 1924 to 1956, this scholarship of \$500 is offered annually in the Faculty of Commerce and Business Administration. It serves not only to pay tribute to his contribution to the Company, but also

to give recognition to his interest and participation, both public and personal, in all matters pertaining to coast-wise shipping, in the Board of Trade, the Vancouver Tourist Association, the Royal Vancouver Yacht Club, the Seattle Yacht Club, and the Pacific International Yachting Association. This scholarship will be awarded to an outstanding student entering the Final Year and majoring in the field of transportation.

The Helliwell Maclachlan & Co. Service Award—This service award will be given to a student in Third Year Commerce who is proceeding to his final year and who anticipates upon graduation entering articles leading to a career in chartered accountancy. Summer employment between the student's Third and Fourth Years will be provided by Helliwell, Maclachlan & Co. and tuition fees will be paid for the student's Fourth Year. The award will be made to a student whose personality, ability and aptitude are, in the opinion of the University, those needed by a successful chartered accountant. Applications are required not later than March 15th.

The Hudson's Bay Company Service Awards—Two service awards, offered annually by the Hudson's Bay Company (Vancouver), are open to students intending a career in the department-store field. They are open, in competition, to students completing Second Year Commerce or, in appropriate options, Second Year Arts or Science, and proceeding to a higher year. To be eligible for these awards, applicants must qualify in respect of academic standing, ability, aptitude and personality, and consider possible employment with the Company on graduation. By the terms of awards, winners will be given their tuition fees for each of the Third and Fourth Years and guaranteed employment with the Company in the summer periods, the Christmas vacations, and at other times, such as Saturdays. Subject to satisfactory performance, they will, on graduation, be given an opportunity for an executive career with the Company. Further information may be obtained from the offices of the Dean of Inter-Faculty and Student Affairs. Inquiry should be made not later than January 15th.

The J. Ewart Collins Memorial Scholarship—This scholarship of \$250 has been established as a memorial to the late J. Ewart Collins, C.A., by the firm of Collins & Collins, Chartered Accountants, of which he was senior partner. The award, which is available annually to a student in Third Year Commerce, will be made to the student who obtains the highest standing in Commerce 353 (Advanced Accounting) and registers in the Fourth Year for Commerce 455 (Auditing).

The Kiwanis Club Scholarship—A scholarship of \$250, the gift of the Kiwanis Club of Vancouver, B.C., will be awarded to the student obtaining highest standing in the Third Year of Commerce and proceeding to the Final Year of that course. The winning of the award does not preclude the holder from enjoying the proceeds of other awards.

The Laurentide Financial Corporation Ltd. Scholarship—This scholarship of \$250, the gift of Laurentide Financial Corporation Ltd., will be awarded annually, on the recommendation of the Faculty, to a student in Commerce or Education. The award will be made to a student with high standing who has shown an aptitude for work in the field of business, and in particular for the field of consumer finance.

Life Underwriters Association of Vancouver Scholarship—A scholarship of \$275, the gift of the Life Underwriters Association of Vancouver, is open to students who are completing the Third Year in the Faculty of Commerce and Business Administration, are taking the course in life insurance offered

in that year, and are proceeding to the Final Year. The selection of the winner will be made by the Faculty on the basis of academic standing, personal qualities, and character. At the discretion of the Faculty, the financial circumstances of those eligible may be a factor in the selection.

The Morrison Steel & Wire Co. Ltd. Service Award—A service award of \$300, donated by Morrison Steel & Wire Co. Ltd., may be available for students in Commerce. The winner of this award will be selected by the Faculty of Commerce and Business Administration on the basis, not only of academic standing, but also on personal qualities, character, and promise in the field of Commerce. During tenure of the award, the winner will be required to undertake, in addition to his formal courses, a programme of training duties arranged by the Faculty.

The Morrow Scholarship in Commerce—In honour of Professor Ellis Henry Morrow, from 1938 to 1950, Head of the Department of Commerce, and in recognition of his service to the University and the community, a fund of \$2000 has been established by the generosity of Walter and Leon Koerner. The annual proceeds of this fund, at present approximately \$100, will be given as a scholarship to the outstanding student enrolled in Commerce 281.

The New York Life Insurance Company Awards—To provide financial assistance for a life insurance education programme in the Faculty of Commerce and Business Administration, the New York Life Insurance Company gave a grant of \$5000 for three years. The grant provides funds for research, fellowships, scholarships, and bursaries in the field of Canadian life insurance. Recipients of the fellowships, scholarships, and bursaries, as well as the terms of award, will be recommended from time to time through the Joint Faculty Committee on Prizes, Scholarships and Bursaries.

The N. Leo Klein Memorial Scholarship—A scholarship of \$150 in memory of N. Leo Klein, and given by the late I. J. Klein, Vancouver, B.C., will be awarded to the student obtaining first place in the examinations of the Second Year of the course in Commerce and proceeding to the next year in that course.

The North Fraser Harbour Commissioners Scholarship—This scholarship of \$500, the gift of the North Fraser Harbour Commissioners, is offered annually to students in Commerce. It will be awarded for study and research or investigation in the field of transportation related to the operations of the Commissioners.

Okanagan-Mainline Real Estate Board Scholarship—Two scholarships of \$500 each, the gift of the Okanagan-Mainline Real Estate Board, are offered annually to students in Commerce and Business Administration who are taking one or more courses in Estate Management, have high academic standing, and are deserving of assistance to further their education. At the discretion of the Faculty these awards may be divided into awards of \$250 each.

The Oppenheimer Bros. & Company Centennial Scholarship—Oppenheimer Bros. & Company (Food Brokers), Vancouver, in memory of Milton B. Oppenheimer, established a scholarship in 1958 to mark the Centennial of the Company, which was founded in Victoria and Yale, British Columbia, in 1858. In the amount of \$500 annually, this scholarship is offered in competition to students in the Faculty of Commerce and Business Administration

who are continuing their studies in the Final Year of the course leading to the degree of B.Com., in the field of marketing, or to graduates in Commerce pursuing study and research toward a higher degree in this field. The winner will be selected on the basis of academic standing, aptitude and promise in the field of marketing, and personal qualities and character. Special consideration will be given to applicants interested in the marketing of food.

The Peat, Marwick, Mitchell & Co. Scholarship—A scholarship of \$300, the gift of Peat, Marwick, Mitchell & Co., will be awarded to a student with high standing in the Second Year of the accounting option in Commerce who is proceeding to the Third Year, and who plans to enter articles (on graduation) with a practising firm of chartered accountants. In making the award, consideration will be given to ability, character and the general academic record of the student.

The Peat, Marwick, Mitchell & Co. Service Award—A service award will be offered annually by the firm of Peat, Marwick, Mitchell & Co., Chartered Accountants, to students intending to enter the profession of public accounting. It will be open, in competition, to students completing Third Year Commerce and proceeding to Fourth Year. To be eligible for this award applicants must qualify in respect of academic standing, ability, aptitude and personality, and consider possible employment with the firm on graduation. By the terms of the award, the winner will be granted his tuition fees for his Fourth Year, and guaranteed employment with the firm during the summer period.

Pemberton Securities Limited Scholarship—A scholarship of \$250, the gift of Pemberton Securities Limited, is offered annually to students in Commerce and Business Administration. This scholarship is open to students who have completed Third Year and are proceeding in the Final Year, or who are in graduate studies. The award will be made on the basis of high academic standing, interest in the field of investment theory, character and ability. Selection of the winner will be made by the Faculty, with preference to a student who is a resident of British Columbia or who intends upon graduation to reside in British Columbia.

The Price Waterhouse & Co. Scholarship—A scholarship of \$300, the gift of Price Waterhouse & Co., will be awarded to a student in the accounting option in Commerce who is at the end of his Third Year, who is proceeding to his Final Year, and who plans to enter articles with a practising firm of chartered accountants. The award will be made to a student with high standing in the Third Year examinations whose academic record, ability, and other qualifications are considered to be outstanding.

Riddell, Stead, Graham & Hutchison Service Award—This service award will be given to a student in Third Year Commerce who is proceeding to the Fourth Year and who intends on graduation to enter articles with a practising firm of chartered accountants. The student will ordinarily be given employment with Riddell, Stead, Graham & Hutchison for the summer and, in addition, his tuition fees will be paid in his Final Year Commerce. The award will be made to the student whose personality, ability, academic record and other characteristics are, in the opinion of the Faculty, those needed by a successful chartered accountant.

The Robert Keith Porter Scholarship—A scholarship in the amount of approximately \$170, the gift of Mrs. Agnes Graham Turnbull in honour of

her son-in-law, Robert Keith Porter, will be awarded annually to a high ranking student in the Faculty of Commerce and Business Administration proceeding to the degree of B.Com.

Robert Lee Prize—A prize of \$100, the gift of Mr. Robert Lee, B.Com. (Brit. Col.), will be awarded for the best graduating essay or master's thesis in the Faculty of Commerce and Business Administration in the field of Estate Management.

Scholarship in Economic Geography—As on page 32.

The Sales and Marketing Executives of Vancouver Scholarship—A scholarship of \$200, the gift of the Sales and Marketing Executives of Vancouver, is available annually for a student in the Fourth Year of the marketing option. The award will be made on the recommendation of the Faculty, consideration being given to character, industry and the general academic record of the student. During the tenure of this scholarship, the student will be required to undertake, along with his courses, certain training duties in the Faculty related to the field of marketing. Due consideration will be given to the financial need of the student selected.

The Sales and Marketing Executives of Vancouver Ben Benwell Scholarship—A scholarship of \$200, the gift of the Sales and Marketing Executives of Vancouver, is available annually to a student in Third Year of the marketing option. The award will be made on the recommendation of the Faculty, consideration being given to character, industry and general academic record of the student. Due consideration will also be given to the financial need of the student selected.

The Society of Industrial and Cost Accountants of British Columbia Scholarship—A scholarship of \$100, gift of the Society of Industrial and Cost Accountants of British Columbia, is offered to a Third Year student in Commerce and Business Administration who obtains the highest standing in Commerce 354 (Cost Accounting) and who has maintained a high over-all academic record.

Touche, Ross, Bailey and Smart Service Award—The service award will be given to a student in Third Year Commerce who is proceeding to the Fourth Year and who intends on graduation to enter articles with a firm of chartered accountants. The student's tuition will be paid in his final year of Commerce and ordinarily he will be given employment with Touche, Ross, Bailey and Smart for the summer. The award will be made to a student whose academic ability and record are, in the opinion of the Faculty, those needed by a successful chartered accountant.

The Trans-Canada Investment Corporation Scholarship—A scholarship of \$150, the gift of the Trans-Canada Investment Corporation Limited, will be awarded to a Third Year student in Commerce who has a high academic standing in the course in business finance. The winner of this scholarship must proceed to a further year's study in Commerce at this University. In selecting the winner, consideration will be given to ability and character.

The Vancouver Junior Chamber of Commerce Scholarship—A scholarship of \$300, the gift of the Vancouver Junior Chamber of Commerce, is offered to students entering the First Year of the Faculty of Commerce and Business Administration. It will be awarded to the student with highest scholastic standing who exemplifies through his character qualities of leadership and independent judgement. If no student is considered sufficiently well quali-

fied with respect to these qualities the award may be withheld. The winning of this award will not preclude the holder from enjoying the proceeds of other awards.

The Vancouver Real Estate Board Scholarship—A scholarship of \$500, gift of the Vancouver Real Estate Board, is offered to a Third Year student in Commerce and Business Administration who is taking the option in Real Estate, has high standing, and is deserving of assistance to further his education in the profession of real estate.

The Vancouver Stock Exchange Scholarship—This scholarship of \$250, the gift of the Vancouver Stock Exchange, is available annually for a student in the finance option in the course leading to the degree of B.Com. It will be awarded on the recommendation of the Faculty to a Third Year student proceeding to the Final Year.

The Victoria Real Estate Board Scholarship—A scholarship of \$250, a gift of the Victoria Real Estate Board, is offered to an undergraduate or graduate student in Commerce and Business Administration who is taking the Estate Management programme, has high academic standing and is deserving of assistance to further his education. The award will be made on the recommendation of the Faculty.

Westminster County Real Estate Board Scholarship—A scholarship of \$500 annually, the gift of the Westminster County Real Estate Board, is offered to a student in Commerce and Business Administration who is taking the Real Estate programme, has high academic standing and is deserving of assistance to further his education. At the discretion of the Faculty the award may be divided into two scholarships of \$250 each.

The Winspear, Higgins, Stevenson and Doane Scholarship in Accounting—A scholarship of \$300, the gift of Winspear, Higgins, Stevenson and Doane, Chartered Accountants, is offered annually to students in the accounting option who are proceeding to the degree of B.Com. This scholarship will be awarded in May to a student who, in the fall, will enter the Third Year. The award will be made on the recommendation of the Faculty to a student of outstanding merit.

The Woodward Scholarships (donated through the Men's Canadian Club of Vancouver)—Two scholarships, established by the late Honourable W. C. Woodward will be available as follows:

1. The sum of \$125 will be awarded to the student in Second Year Commerce who obtains highest standing in Commerce 261 and is proceeding to the Third Year.
2. The sum of \$125 will be awarded to the student in Third Year Commerce who obtains highest standing in Commerce 362 and is proceeding to the Fourth Year.

To be eligible for either of these awards, the student must also obtain high standing in his other courses.

In Dentistry

American College of Dentists Scholarship—This scholarship of \$50, gift of the American College of Dentists (Washington - British Columbia Section), is offered to students completing the Second year of Dentistry. It will be awarded by the Faculty of Dentistry, in consultation with the Scholarship Committee of the University, on the basis of character and academic record during the first two years of Dentistry.

The British Columbia Dental Supply Co. Limited Scholarship—A scholarship of \$200, the gift of The British Columbia Dental Supply Co. Limited, is open to students proceeding to dentistry. It will be awarded to the student in attendance at the University who has completed the pre-dental requirements, has been accepted by an approved school or college of dentistry, and in the opinion of the Scholarship Committee, is best qualified in terms of academic standing, personal qualities, and promise in dentistry. Applications must be submitted not later than April 30th.

Dr. John B. Macdonald Scholarship—A scholarship of \$300, established by the Vancouver B'nai B'rith Hillel Foundation in honour of President John B. Macdonald, is offered annually to a student entering the Faculty of Dentistry at the University of B.C. This scholarship will be awarded on the recommendation of the Faculty to the student whose qualifications and promise in the field of Dentistry are the most outstanding.

The International College of Dentists Scholarship—This scholarship of \$100, gift of the International College of Dentists (Canadian Section), is offered to students completing the Third Year of Dentistry. It will be awarded by the Faculty of Dentistry, in consultation with the Scholarship Committee of the University, on the basis of character, participation in extra-curricular activities, and academic record in the Third Year.

The Max M. Waterman Prize—This prize of \$25, established by Dr. M. J. Waterman in honour of his father, is to be awarded annually to the second year student who demonstrates the best performance in Dental Morphology (Oral Biology 410 and 420).

The Robert D. Sheret Memorial Scholarship (B.C. Dental Association)—As a memorial to Robert D. Sheret and to mark the esteem and affection in which he was held, the B.C. Dental Association offers annually a scholarship of \$250. This scholarship is open to residents of British Columbia who are enrolled in the Faculty of Dentistry at the University of British Columbia. It will be awarded to the student who, in the opinion of the Scholarship Committee, has the most outstanding academic record.

In Education and Teacher Training

The British Columbia Parent-Teacher Federation Scholarship—The sum of \$200 will be awarded to a student, showing ability and need, who intends to qualify as a home economics teacher either through the School of Home Economics and the Faculty of Education, or through the Faculty of Education. This scholarship will be awarded preferably for the Final Year. Applications are required by May 15th.

The British Columbia Teachers' Federation Scholarships in Teacher Training—See page 148.

The British Columbia Teachers' Federation Undergraduate Scholarships for Teachers—See page 148.

The Delta Kappa Gamma Society Scholarship—A scholarship of \$300, the gift of Alpha and Beta Chapters in British Columbia of Delta Kappa Gamma, an international honorary association of women educators, is available in the Faculty of Education. It will be awarded to a woman student who has Senior Matriculation or First Year University standing, or the equivalent, and who is proceeding to a degree or certificate in the teaching field. The award will be made on the basis of academic standing, personal qualities, and aptitude for and interest in teaching. Applications, on forms available from the Dean

of Inter-Faculty and Student Affairs, must be submitted to the University not later than May 15th.

The Dr. Evelyn Fenwick Farris Scholarship in Education—A scholarship of \$400, the gift of the University Women's Club of Vancouver, is offered annually to women students at this University in the full winter session who are graduates of other Faculties entering the professional year in Education, or undergraduate students entering the Final Year of a Bachelor of Education programme. This scholarship will be awarded to the applicant who, in the opinion of the Faculty of Education, is best qualified in terms of her personal qualities and academic record. Applications must be submitted by May 15th.

The Dr. H. B. King Memorial Scholarship in Education—This scholarship of \$300 has been established by the B.C. Association of District Superintendents and Inspectors of Schools as a memorial to Dr. H. B. King, who from 1939 to 1945 was Chief Inspector of Schools for British Columbia. For many years prior to 1939, Dr. King also served the Province of British Columbia with distinction and devotion as a teacher and principal, and as technical adviser with the Department of Education. This scholarship will be awarded to a student who is proceeding to a degree or certificate in the teaching field and is taking a full course in the Second Year at any recognized Faculty of Education in a B.C. University. The award will be made on the basis of academic standing, personal qualities, interest and participation in school and community affairs, aptitude for teaching, and other factors. Applications, on forms obtainable from Walter H. Gage, the Dean of Inter-Faculty and Student Affairs, must be submitted to the University not later than May 15th.

The Ernest A. Munro Memorial Scholarship—This scholarship in memory of Ernest A. Munro, offered by his wife, Nancy Munro, and his sister, Constance Munro, gives recognition to his distinguished services as a principal and teacher in the Vancouver schools, including King Edward, Prince of Wales, Britannia and Magee. In the amount of \$150, it will be awarded in the session 1966-67 to an outstanding student who needs financial assistance and who is proceeding to teacher training.

The Jeanette Dewitt-Huberman Memorial Prize—This prize of \$25, to honour of the memory of Jeanette Dewitt-Huberman, is offered to students preparing for a career in teaching exceptional groups or individuals such as the mentally retarded, the emotionally disturbed, or the specially gifted. It will be awarded to a student who not only has a good academic record but who also has the qualities of vitality and sincerity, and an understanding of differing points of view arising from factors such as national origin or religious faith.

The Marion Langridge Scholarship Fund—This scholarship of \$400, the gift of the Vancouver Secondary Women Teachers, is offered to a woman student who is entering her Final Year and who proposes to take, in the session 1967-68, the one-year Teacher Training Course for graduates leading to a Secondary Teaching Certificate at the university to prepare for teaching at the secondary level or to a woman student entering her Fourth Year of the five-year Bachelor of Education programme for secondary teaching. The award will be made on the basis of academic ability, interest in and aptitude for teaching, and qualities of leadership. Applications on special forms must be submitted to the Dean of Inter-Faculty and Student Affairs not later than May 15th.

The Mathilde MacInnes Memorial Scholarship—As a memorial to his wife, Mathilde MacInnes, and in recognition of her interest in young people, this scholarship of \$250 annually has been established by Mr. W. H. MacInnes in the field of Education. It will be awarded to the student who obtains the highest standing in the First Year of the course leading to the B.Ed. degree (elementary teaching field) and is proceeding to the Second Year of that course.

The Pi Beta Phi Fraternity, Vancouver Alumnae Club, Scholarship—A scholarship of \$250, the gift of the Vancouver Alumnae Club of Pi Beta Phi Fraternity, is offered annually to students entering the Final Year of Education who have completed one year of general training in the teaching of handicapped children. In the selection of the winner, priority will be given to students planning to specialize in the teaching of blind children, but if there is no suitable candidate in this field, the award may be offered to a student planning to teach deaf or mentally or physically handicapped children. Although the scholarship is awarded on merit, financial need may be a factor if two or more candidates are considered to be equally well qualified. If, in any year, there is no suitable candidate for this scholarship, a scholarship of \$250 will be offered to a blind student in any year and faculty who has good scholastic standing, needs financial assistance, and shows promise of success in his or her programme of studies. Applications must be submitted by May 15th.

The Saul Grand Scholarship—This scholarship of \$100, established as a memorial to Saul Grand by the Vancouver Section of the National Council of Jewish Women of Canada, will be awarded to a student in First Year Education proceeding to a degree or certificate in the teaching field. To be eligible for this award a student must not only have high academic standing, but also possess those qualities of character and personality which are necessary for success in teaching elementary and secondary school children. Applications must be submitted by May 15th.

The Smith, Davidson & Lecky Ltd. Scholarships in Education—Two scholarships of \$250 each, the gift of Smith, Davidson & Lecky Ltd., are offered annually to students proceeding to secondary teaching in the Province of British Columbia. These scholarships are open in competition to applicants entering the Final Year of the programme leading to the B.Ed. degree (secondary) or the one-year Teacher Training Programme for Graduates. Applicants will be considered on the basis of their overall academic standing and achievement in their major areas of specialization, on their promise of success in teaching, personal qualities, and character, and on their need for financial assistance. Applicants must submit their applications not later than May 15th.

The Vancouver Elementary School Teachers' Association Scholarships—Eight scholarships of \$150 each, the gift of the Vancouver Elementary School Teachers' Association, are offered to students who are residents of Vancouver, have attended a Vancouver elementary school, and are proceeding to a degree or certificate in teaching. Winners are selected on the basis of academic achievement. The awards offered are:

- (a) **The Elizabeth Dobbins Memorial Scholarship**—Open to students entering the First Year of the Faculty of Education.

- (b) **The Owen J. Thomas Scholarship**—Open to students entering the First Year of the Faculty of Education.
- (c) **The Elsie Roy Recognition Award**—Open to students entering the First Year of the Faculty of Education.
- (d) **The A. E. Henderson Memorial Scholarship**—Open to students entering the First Year of the Faculty of Education.
- (e) **Other Awards (Four)**—One scholarship for students entering the First Year of the Faculty of Education; and one scholarship to be awarded to each of the top students proceeding from the First, Second, Third and Fourth Years respectively to the next higher year of teacher training.

Students who wish to be considered for these scholarships should submit application forms, obtainable from the Dean of Inter-Faculty and Student Affairs, not later than May 15th.

The Vancouver Secondary School Teachers' Association Scholarships—These scholarships, the gift of the Vancouver Secondary School Teachers' Association, are available to students entering the Teacher Training Course for graduates, leading to a British Columbia Secondary Teaching Certificate. The awards offered are:

- (a) **The Dr. Hugh MacCorkindale Scholarship in Teacher Training**—A scholarship of \$300 in honour of Dr. Hugh N. MacCorkindale and in recognition of his distinguished services as a teacher and administrator in the Vancouver School system from 1914 to 1954.
- (b) **The Owen J. Thomas Scholarship in Teacher Training**—A scholarship of \$300 as a tribute to Owen J. Thomas, who from 1911 to 1956 gave devoted service and inspirational leadership to the teachers of this Province.

In making these awards, consideration will be given to academic standing, personal qualities, and interest in teaching as a career. Financial circumstances may also be a factor. Candidates may apply or be nominated by members of the teaching profession or University staff. Application forms, which may be obtained from the office of the Dean of Inter-Faculty Affairs, must be submitted to the University by May 15th.

The West Vancouver Teachers' Association Scholarship—The West Vancouver Teachers' Association offers annually a scholarship of \$200 to graduates of West Vancouver Secondary Schools who have successfully completed the first two years in the Faculty of Education (Elementary or Secondary programme) and who plan to continue their studies in this Faculty through one or more additional winter sessions. The winning candidate will be selected on the basis of high academic standing in the final examinations of the Second Year and promise in practice teaching. Students who wish to be considered for this scholarship must, when the Second Year results are known, apply in writing to the Dean of Inter-Faculty and Student Affairs. The scholarship will be presented upon proof of registration in any subsequent regular winter session, provided that such registration takes place within five years of the naming of the successful candidate. Selection will be made by the Chairman of the Scholarship Committee and the Dean of Education in consultation with the W.V.T.A. Scholarship Committee.

In Engineering

The Alcan Scholarships—Two scholarships are offered annually by the Aluminum Company of Canada, Limited, to undergraduates in Honours Courses in the Faculties of Applied Science (Engineering) and Science, or to those in other faculties specializing in subjects related to the industrial field of the Company. Each scholarship has the value of \$500 and is supplemented by a general grant of \$300 to the University. The winners will be selected by the University on the basis of academic standing, character and ability. Because it is the desire of the Company to assist worthy and deserving students, financial circumstances will also be a factor. The awards are normally available to Third and Fourth Year students. At the discretion of the University, however, they may be awarded to students in the junior years.

Allied Chemical Canada Scholarship—As on page 71.

The American Institute of Chemical Engineers Award—This award, donated by the American Institute of Chemical Engineers, is given in the Third Year to the Chemical Engineering student, who, during the First and Second Years of Engineering, has received the highest scholastic rating in his courses. The award consists of a student A.I.Ch.E. membership pin and certificate, and a two-year subscription to one of the Institute publications.

American Society for Metals, B.C. Chapter, Scholarship—A scholarship of \$400, gift of the B.C. Chapter of the American Society for Metals, is offered to students entering the Third Year in Metallurgy. The award will be made, on the recommendation of the Department, to a student of high academic standing who shows ability and promise in the field of metallurgy. Applications required by April 30th.

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers Scholarship (sponsored by the B.C. Chapter)—A scholarship given by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, and sponsored by their B.C. Chapter, is offered annually to a Third Year student in Mechanical Engineering who is proceeding to the Fourth Year. In May, 1964, the award was in the amount of \$250. The scholarship will be awarded, on the basis of merit and need, on the recommendation of the Head of the Department, to a student with a special interest in the heating, ventilating, air-conditioning and refrigeration industry.

The Annie M. Mack Scholarship—A bequest from the late Annie M. Mack, Vancouver, provides annually a scholarship of approximately \$250. This scholarship will be awarded to a worthy and deserving student in engineering.

The Asarco Scholarship—As on page 71.

The Association of Professional Engineers' Prizes—Six book prizes, each of the value of \$50, are offered by the Association of Professional Engineers of the Province in competition to those students in the Third Year of the Faculty of Applied Science who are enrolled as engineering pupils in the Association. These prizes are awarded for the best summer essay in each of any six branches of engineering to be selected by the Faculty. The successful essays may be made available by the Faculty to the Council and members of the Association.

The B'nai B'rith Chapter No. 77 Scholarship—A scholarship of \$50, given by the Women's Chapter No. 77 of the B'nai B'rith, will be awarded to the student in the Third Year of Applied Science standing highest in the class of Chemical Engineering or Chemistry and proceeding to the Fourth Year.

The Boulton-Bosustow Memorial Scholarship (donated through the Men's Canadian Club of Vancouver)—A scholarship of \$250, established by the late Mr. Austin C. Taylor in memory of his associates, William W. Boulton and Richard Bosustow, will be awarded annually to a student completing the Third Year in Mining or Metallurgical Engineering and proceeding to the Fourth Year in either of these fields. The winner of this scholarship will be chosen on the basis of ability and general proficiency in the courses in Mining and Metallurgy.

The British Columbia Forest Products Limited Scholarships in Engineering—British Columbia Forest Products Limited offers six scholarships of \$1000 each (payable \$500 a year for two years) to students proceeding from Second to Third Year. They are open to students whose homes are in (1) the area comprised of School Districts 42 (Maple Ridge), 43 (Coquitlam), 75 (Mission); (2) the area comprised of School Districts 61 (Greater Victoria), 62 (Sooke), 63 (Saanich); or (3) the area comprised of School Districts 65 (Cowichan), 66 (Lake Cowichan), 67 (Ladysmith). Two scholarships, one for mechanical and one for chemical engineering are offered in each of the areas (1), (2), (3). If no candidate in one of these areas qualifies, the award will be available to a candidate in the other areas. The awards will be made on the basis of academic ability and overall personal qualities. Students who wish to be considered for these awards should consult the Dean of Inter-Faculty and Student Affairs by March 15th.

British Columbia Hydro and Power Authority Undergraduate Scholarships in Engineering—Twelve scholarships of \$250 each are offered by British Columbia Hydro and Power Authority to students in the various branches of engineering. Six of the scholarships will be available to students who, in the fall, will proceed to the Final Year, and six to those who will proceed to the Third Year. Selection of winners will be made by the Scholarship Committee, in consultation with departments.

The Canadian Forest Products Ltd. Scholarships in Engineering—Two Scholarships, one of \$250 and the other of \$200, the gift of Canadian Forest Products Ltd., are offered to students in the Second or Third Year of Chemical, Civil, or Mechanical Engineering who are proceeding to the next higher year. They will be awarded on the basis of proficiency, with preference being given to students with special interest in areas related to the forest industry.

The Canadian Institute of Mining and Metallurgy B. C. Section Prizes—Three book prizes to the value of approximately \$40 each, the gift of the B.C. Section of The Canadian Institute of Mining and Metallurgy, are offered annually to students registered in the Third Year of Applied Science and enrolled in Geology, Mining, or Metallurgy. These prizes, one in each of the above fields, will be awarded to members of the G. M. Dawson Club for the best essays written during the summer between the Second and Third Years.

The Chemical Institute of Canada Book Prize—As on page 72.

Chevron Standard Limited Undergraduate Scholarships—As on page 72.

The Columbia Cellulose Company, Limited Prize in Chemical Engineering—This prize of \$50, gift of Columbia Cellulose Company, Limited, will be awarded annually to the undergraduate who obtains the highest standing in Chemical Engineering 470.

Cyanamid of Canada Limited Scholarship—A scholarship ranging from \$500 to \$750, gift of Cyanamid of Canada Limited (Montreal) is offered to undergraduate students in Chemical Engineering. It will be awarded on the basis of promise and high scholastic standing.

Dow Chemical of Canada Limited Scholarship in Chemical Engineering—A scholarship of \$500, gift of Dow Chemical of Canada Limited, will be available annually to a student entering the Final Year of Chemical Engineering. It will be awarded to a student who has a sincere interest in the chemical industry, has demonstrated leadership in extra-curricular activities, and is academically well qualified. Consideration will also be given to personal qualities and character. Winners of this award may not hold other scholarships. Additional to the scholarship, a grant of \$250 will also be made by the Company to the Department of Chemical Engineering to help defray the costs of equipment, supplies, and administration.

The Dr. and Mrs. J. E. Kania Scholarship—This scholarship of \$200, the gift of Dr. and Mrs. J. E. Kania, will be awarded to a graduate or undergraduate for study and investigation of the problem of fish and power. The winner will be selected by the Scholarship Committee, in consultation with the Head of the Department of Civil Engineering, on the basis of academic standing, promise of ability in research, and interest in the field in which the scholarship is offered.

The Dunsmuir Scholarship—A scholarship of \$250, founded by the Hon. James Dunsmuir, will be awarded to the undergraduate student standing highest in the Mining Engineering course of the Third Year in Applied Science, and proceeding to the Fourth Year.

The Engineering Institute of Canada Prize—The Engineering Institute of Canada offers an annual prize of \$50, donated by the Life Members of the Institute, to each of twenty Canadian Universities, of which the University of British Columbia is one. The prize will be awarded to a student in Applied Science in the year prior to the Graduating Year on the basis of the marks made in his academic work in that year and his activities in the student engineering organization or in the local branch of a recognized engineering society.

Engineering Institute of Canada (Vancouver Branch) Prize—A prize of \$100 will be awarded to a student proceeding to Third Year Engineering. It will be awarded on the basis of overall standing in the Second Year to a member of the E.I.C. Student Chapter who has not received other scholarships or prizes. The award will be made in the fall, on the recommendation of the Dean.

Engineering Institute of Canada (Vancouver Branch) Walter Moberly Memorial Prize—A book prize of the value of \$50, given by the Vancouver Branch of the Engineering Institute of Canada, will be awarded to a student in the Faculty of Applied Science. This prize is given in memory of the late Walter Moberly, pioneer engineer, explorer, and discoverer of the Yellowhead Pass through the Rocky Mountains, whose work in railway location so greatly influenced the development of the Province of British Columbia. The award will be made in the fall, on the recommendation of the Dean, to a student registered in Second Year who has not received another prize or scholarship and who is a member of the E.I.C. Student Chapter. The basis of award will be overall standing in the First Year.

The Finning Tractor & Equipment Co. Ltd. Scholarships—Six scholarships of \$300 each, the gift of the Finning Tractor & Equipment Co. Ltd., are offered to Third or Fourth Year students. Of these scholarships, one

will be awarded in each of Commerce, Forestry, Civil Engineering, Mining and Metallurgy, Forestry Engineering, and Mechanical Engineering. At least one of the awards will be given each year to an out-of-town student. In making the awards, consideration will be given not only to the ability, both academic and practical, but also to the financial circumstances of applicants. The awards will be made by the Scholarship Committee in consultation with the departments concerned.

The G. M. Dawson Scholarship—A scholarship of \$50 will be awarded to the undergraduate student standing highest in the Geological Engineering course, in geological subjects, in the Third Year of the Faculty of Applied Science, and proceeding to the Fourth Year.

The Heavy Construction Association of B.C. Graduation Prize—A prize of \$50, gift of the Heavy Construction Association of B.C., will be awarded to a student graduating in Civil Engineering. Provided for the purpose of stimulating interest in the field of highway engineering, this award will be made to the student obtaining highest standing in C.E. 470 (Highway Engineering).

The Heavy Construction Association of B.C. Scholarships—Scholarships to the total of \$950, gift of the Heavy Construction Association of B.C., are open annually to students proceeding from Second and Third Year to the next year in Civil Engineering. Of these awards, two scholarships of \$250 each will be awarded to students entering the Final Year and two scholarships, one of \$250 and the other of \$200, to students entering the Third Year. Selection of the winners will be made on the basis of academic standing, particularly in subjects basic to heavy construction and highway engineering, and upon ability, experience, and interest in these fields. Special consideration will be given to those students whose summer essays are on topics related to heavy construction or highway engineering. Students interested in being considered for these awards should consult the Dean of Inter-Faculty and Student Affairs before April 30th.

The Hoffars Ltd. Scholarship in Machine Design and Applied Mechanics—This scholarship, to the value of \$300, the gift of Hoffars Ltd., will be awarded to a student with an outstanding record in Third Year Mechanical Engineering who is proceeding to the Final Year of the course leading to the degree of Bachelor of Applied Science. The award will be made to the student with the highest aggregate standing in courses in the area of machine design and applied mechanics.

The H. R. MacMillan Prize in Forest Engineering—A prize of \$100, the gift of H. R. MacMillan, Esq., C.B.E., D.Sc., LL.D., will be awarded to the student graduating with highest standing in the course for the B.A.Sc. degree in Forest Engineering.

The Ingledow Scholarships in Engineering—Two scholarships of \$150 each, the gift of Dr. T. Ingledow, P.Eng., are offered annually to students in the B.A.Sc. course. One of these scholarships will be awarded in the spring to a student completing the Second Year and the other in the fall to a student entering the First Year. They will be awarded to students of outstanding merit and promise. The winner of the Second Year scholarship must be an engineering pupil of the Association of Professional Engineers of British Columbia, and the winner of the First Year scholarship will be required to enroll before receiving the award.

John Boyd Scholarship (donated through the Men's Canadian Club of Vancouver)—A scholarship of \$200, portion of a gift of \$500 from John

Boyd (Standard-General Construction, International Ltd.), will be awarded to a student who completes the Second Year of Applied Science (Engineering) and is proceeding to the Third Year. The award will be for proficiency in the work of the First and Second Years.

Kennecott Copper Corporation Scholarship in Mining—This scholarship of \$1000, gift of Kennecott Copper Corporation, New York, will be awarded to a student entering the Third or Fourth Year of the course leading to the degree of B.A.Sc. in Mining Engineering. Selection will be based on (1) proficiency in studies; (2) enthusiasm, leadership, co-operativeness, initiative, and ambition; (3) good health and sturdy constitution; (4) financial need. Proficiency in studies is given prime importance and other factors are considered in the order listed. Intending applicants should consult the Dean of Inter-Faculty and Student Affairs before January 31st.

Lafarge Cement of North America Ltd. Scholarship in Civil Engineering—A scholarship of \$500, the gift of Lafarge Cement of North America Ltd., is offered to students entering the Senior Year of Civil Engineering. The winner will be selected on the basis of proficiency in studies, character, and personal qualities, with preference being given to those with outstanding records in structural design, concrete design, or foundation courses.

The Lambert Scholarship—A scholarship of \$300, the gift of Brigadier Noel D. Lambert, will be awarded annually to the student obtaining highest standing in the Third Year of Civil Engineering and proceeding to the Fourth Year of that course.

Lefevre Gold Medal and Scholarship—As on page 11.

The Letson Memorial Prize—This prize, the gift of Letson and Burpee Limited and consisting of books to the value of approximately \$25 and a cash award of \$100, will be awarded to the head of the graduating class in Mechanical Engineering.

The Louis Ware Senior Scholarship—As on page 74.

Merrill Prindle Book Prize in Engineering—This prize, consisting of books to the value of \$50, the gift of a graduate of the University of B.C. to honor his parents and to recognize their contribution to his education, is offered annually to a student graduating in Engineering. It will be awarded on the basis of good academic standing, personal qualities, and character, combined with contributions through active participation in the Engineering Undergraduate Society.

The Monsanto Canada Limited Scholarship in Chemical Engineering—A scholarship of \$750, gift of Monsanto Canada Limited, will be awarded annually to a student in Chemical Engineering who has completed the Third Year and is proceeding to the Final Undergraduate Year. The award will be made on the recommendation of the Head of the Department.

The Morgan Warren Scholarship—This scholarship, established and maintained as a memorial to Morgan Warren by his friends and colleagues, will be awarded annually to a student in Mechanical Engineering who has a special interest in the fields of heating, ventilation, and air-conditioning. It will be awarded on the recommendation of the Department to a student of good academic record and promise who is worthy and deserving of assistance. This scholarship, in the amount of \$100, will be supplemented by a loan of \$150, repayable after graduation.

The MacKenzie Swan Memorial Scholarship—A scholarship of the annual value of \$1000, given by Colonel W. G. Swan in memory of the late Catherine MacKenzie Swan who passed away December, 1961, and of their son, William MacKenzie Swan, an outstanding all-round undergraduate student and popular athlete, who died July 28th, 1937, as a result of injuries received in a fall from the Pattullo Bridge at New Westminster, on which he was engaged as Assistant Engineer, will be awarded to a student or students registered in the Second, Third or Fourth Year of the Faculty of Applied Science and requiring financial assistance to enable him or them to continue studies at the University. In making the award, consideration will be given to the academic record of the applicant and to his participation in undergraduate affairs.

MacMillan, Bloedel and Powell River Limited Scholarship for Mechanical or Chemical Engineering—One scholarship of \$500, the gift of MacMillan, Bloedel and Powell River Limited, is offered to students who will be entering the field of Mechanical or Chemical Engineering the following session. Awards will be made on the basis of academic standing, personal qualities and interest in the field. Students who wish to be considered for these scholarships should apply to the Dean of Inter-Faculty and Student Affairs by March 15th.

Northern Commercial Company Limited Scholarship—This scholarship of \$500, the gift of Northern Commercial Company Limited, Seattle, is available for students in Engineering. The award will be made to a student with high scholastic standing. In the selection of the winner, consideration will also be given to personal qualities and character, and to demonstrated aptitude in both practical and theoretical aspects of engineering. Preference and special consideration will be given to students from the Yukon Territory.

Northern Electric Undergraduate Scholarship—As on page 74.

Ocean Cement Limited—B.C. Cement Division—Civil Engineering Scholarship—A scholarship of \$250, donated annually by Ocean Cement Limited—B.C. Cement Division, is offered to students in Engineering. It will be awarded to a student who is completing Second or Third Year and is continuing in Civil Engineering at this University. The award will be made to a student who has an outstanding academic record and who, in the opinion of the Faculty, shows unusual promise and ability. The winner must be enrolled as an engineering pupil with the Association of Professional Engineers of British Columbia.

Paper Industry Management Association Scholarship—A scholarship in the amount of \$500 (U.S.) for one academic year is offered by Paper Industry Management Association, Pacific Coast Division, to undergraduates majoring in chemical, civil, electrical, industrial or mechanical engineering. To qualify an applicant must have a good scholastic record and be in need of financial assistance to pursue his university studies. Preferably, candidates should be in the earlier part of their university programme. They must have an interest in a career in the pulp and paper industry and be willing to accept summer employment in a northwest pulp or paper mill. Although PIMA does not guarantee summer employment, it will assist in finding it. Interested students should consult the Dean of Inter-Faculty and Student Affairs before January 31st.

The Rayonier Canada (B.C.) Limited Scholarship in Chemical Engineering—This scholarship of \$500, offered annually by Rayonier Canada Limited, is available to students in Third Year Chemical Engineering who

are proceeding to the Final Year. The award will be made to the student whose academic and practical work of the year is, in the opinion of the Faculty, the most outstanding. Other factors being equal, however, preference will be given to the son or daughter of an employee of the Company.

The Rayonier Canada (B.C.) Limited Scholarship in Mechanical Engineering—This scholarship of \$500, offered annually by Rayonier Canada Limited, is available to students in Third Year Mechanical Engineering who are proceeding to Final Year. The award will be made to the student whose record in the academic and practical work of the year is, in the opinion of the Faculty, the most outstanding. Other factors being equal, however, preference will be given to the son or daughter of an employee of the Company.

The Read, Jones, Christoffersen Limited Scholarship in Civil Engineering—A scholarship of \$200, the gift of the firm of Read, Jones, Christoffersen Limited, Civil and Structural Engineers, Vancouver, is offered annually to students proceeding from the Third Year to the Fourth Year in Civil Engineering. The award will be made to a student who has a good academic record and who, by his laboratory work, projects, summer and other experience, has demonstrated his promise and ability in both the academic and practical aspects of engineering. In selecting the winner, consideration will also be given to the financial circumstances of those who are eligible.

Royal Institution Scholarship in Applied Science—A scholarship of \$200 will be awarded for general proficiency in the work of the First Year to a student who is proceeding to the Second Year.

The R. Randolph Bruce Scholarship—Out of the proceeds of a fund bequeathed to the University of British Columbia by the late Honourable R. Randolph Bruce in memory of his term as Official Visitor, a scholarship of \$270 will be offered annually to the undergraduate student standing highest in the Metallurgical Engineering course in the Third Year in Applied Science and proceeding to the Fourth Year.

Schlumberger of Canada Scholarship—The Schlumberger of Canada Scholarship in the amount of Five Hundred Dollars (\$500) is based on superior academic ability and is tenable in Third or Fourth Year Electrical, Mechanical, Petroleum or Geological Engineering, or in the Fourth or Fifth Year in honours Physics, honours Geology, or honours Mathematics and Physics. Selection of the scholarship recipient is to be made by the University. To be awarded in May, 1967, and May, 1968.

The Society of Chemical Industry Merit Awards—As on page 74.

S. P. Slinn Scholarship in Engineering—A scholarship of \$100, the gift of S. P. Slinn Ltd., Consulting Engineers, will be awarded to a student in Engineering who is worthy and deserving of financial aid.

The Stephen Kenneth Nelson Memorial Scholarship—This scholarship was established by friends and classmates of Stephen Kenneth Nelson, who graduated in Geological Engineering from the University in May, 1963, and tragically lost his life while engaged in survey work in August of the same year. It serves to pay tribute, not only to his fine academic record, but also to his outstanding personal qualities. This scholarship will be awarded on the recommendation of the Department to a member of the Dawson Club entering the Final Year of Mining Engineering, Geological Engineering or Geology, whose overall qualifications are considered to be the most outstanding.

The Timber Preservers Limited Prizes—Prizes of the value of \$100, \$60, and \$30, together with three merit awards of \$20 each, given by the Timber Preservers Limited, will be awarded to the students enrolled in the course of Engineering Law (C.E. 476) of the Fourth Year of Civil Engineering in the Faculty of Applied Science who submit specifications, judged to be the best, of a structure of modern engineering timber construction requiring preservative treatments. The awards will be made upon the recommendation of the donors in collaboration with the instructor in charge of the course.

The UBC Engineer Prizes—A prize of \$75 is offered for the best essay by a graduate student in Applied Science published in the 1967 UBC Engineer. A separate prize of \$75 is also offered for the best essay published by an undergraduate in Applied Science. For the undergraduate prize, any summer essay will be considered if an extra copy is filed with the Editor of the UBC Engineer, Electrical Engineering Department. Closing date for submission of essays is November, 1966.

University Scholarship in Applied Science—A scholarship of \$200 will be awarded to the student who obtains the highest marks in the Second Year in Engineering and who is proceeding to the Third Year.

The Western Canada Steel Limited Scholarship in Metallurgy—A scholarship of \$1000, the gift of Western Canada Steel Limited, is offered annually to a student who has completed the Second Year in Applied Science and is proceeding to Metallurgical Engineering at this University. The winner of this scholarship will receive \$500 during each of the Third and Fourth Years, payment in the Fourth Year being dependent upon satisfactory standing in the previous years. Selection will be based on: (1) proficiency in studies; (2) interest in and aptitude for work in metallurgy; and (3) character and qualities of leadership. If no suitable candidate applies, the award will be withheld and two scholarships will be available in the following year. Intending applicants should consult the Dean of Inter-Faculty and Student Affairs before April 30th.

The William McMahan Scholarship—A scholarship of approximately \$600, established and endowed by William McMahan, Esq., Vancouver, is offered annually to students entering their Second, Third, or Final Year in chemical, civil, electrical, or mechanical engineering, or in forestry or forest engineering. This scholarship is open to sons and daughters of employees of the Logging Divisions, the Pulp Division, or the Head Office Division of Canadian Forest Products Ltd., or, failing a suitable candidate from these divisions, to sons and daughters of employees in other divisions of the Company. If, in the judgment of the University, there are two students deserving of the award, it will be divided between them. If no such candidate is available, or, in the opinion of the University, no candidate has a sufficiently good academic record to merit the award, the University may grant the scholarship to a worthy and deserving student in Engineering or Forestry from the student body at large. Candidates in the preferred categories should submit their names and details of family service with the Company to the Dean of Inter-Faculty and Student Affairs by March 15th.

In Forestry

The British Columbia Loggers' Association Entomological Scholarship—To encourage graduates and undergraduates in the work of forest entomology the British Columbia Loggers' Association has donated an annual scholarship

of \$300. This scholarship is available to Forestry students registered in the Second or a higher year at the University of British Columbia. The award will be made on the recommendation of the Faculty of Forestry. Applications, on forms available at the office of the Dean of Inter-Faculty and Student Affairs, should be received by March 15th, but in the event that the award is not made in the spring, further applications will be invited in the fall. In making the award, special desire and aptitude for research in forest entomology will be governing factors. Due weight will also be given to scholastic standing and physical fitness.

British Columbia Lumberman Essay Awards—The British Columbia Lumberman magazine will award three essay prizes of \$100, \$75 and \$50 respectively for the best essays in the fields of general forestry, logging or forest products submitted by Forestry students entering Fourth Year. Selection of the best essays will be made by the Faculty of Forestry. Publication in the British Columbia Lumberman will be at the discretion of the donors.

The Canadian Forest Products Ltd. Prizes in Forestry—Two prizes of \$100 each, the gift of Canadian Forest Products Ltd., will be awarded to students graduating in Forestry with the degree of B.S.F., in the Harvesting Option. The awards will be made on the basis of proficiency in the work of the final two years. In the event that candidates in the Fourth Year do not qualify, the prizes may be awarded to students in the Second or Third Years in these fields who have obtained high standing in the final examinations.

The Canadian Forest Products Ltd. Scholarships in Forestry—Two scholarships of \$250 each, the gift of Canadian Forest Products Ltd., will be awarded to the students attaining highest standing in the Third Year of the Harvesting Option of the B.S.F. course and proceeding to the Fourth Year. In the event that students entering the Fourth Year do not qualify, the scholarships may be awarded on the basis of proficiency to students in these courses proceeding to the Second or Third Year.

The Canadian Forestry Association (B.C. Branch) Scholarship—As on page 78.

Commonwealth Forestry Bureau Book Prize—This prize, gift of the Commonwealth Forestry Bureau, Oxford, and consisting of a year's issue of Forestry Abstracts and other publications, is awarded to the outstanding student in the graduating class.

The David Bell Little Memorial Scholarship—A scholarship of \$100, established as a memorial to David Bell Little, B.S.F. (1958), by his friends and family, is offered to Second Year students in the Faculty of Forestry who are proceeding to the Third Year. It will be awarded to the student who, in the opinion of the Faculty, is most outstanding in those qualities of character and leadership, promise and interest in forestry, and scholarship for which David Little was distinguished in his undergraduate and graduate studies at this University.

The Finning Tractor & Equipment Ltd. Scholarships—As on page 47.

Forestry Summer Camp Scholarship—A scholarship of \$75, donated by F. Malcolm Knapp, Professor Emeritus of Forestry, will be awarded to the Third Year student obtaining the highest marks at the Forestry Summer Camp. To be eligible the student must have been an active participant during ninety per cent of the camp period. Leadership and participation will be considered in making the award.

The Galt Elkington Memorial Scholarship—A scholarship of \$400 has been endowed by Dr. and Mrs. Eric H. W. Elkington of Victoria in memory of their son, Galt Elkington, B.Sc., B.A. (McGill), a graduate student at the University of B.C. who lost his life by drowning in August, 1955, while employed with the B. C. Forest Service. In recognition of his special interest in forestry, this scholarship will be awarded annually to a student in the Faculty of Forestry who is completing the Third and proceeding to the Final Year. In making the award, consideration will be given, not only to academic standing, but also to personal qualities, character, and interest and promise in the field of Forestry.

The H. R. MacMillan Scholarships in Forestry—Through the generosity of H. R. MacMillan, Esq., C.B.E., D.Sc., LL.D., four scholarships to the total of \$600 will be available for students in Forestry. These awards are as follows:

- (a) a scholarship of \$200 for the student with the highest standing in Second Year Forestry;
- (b) a scholarship of \$100 for the student in Second Year Forestry with the next highest standing;
- (c) a scholarship of \$200 for the student with the highest standing in First Year Forestry;
- (d) a scholarship of \$100 for the student in First Year Forestry with the next highest standing.

These awards are available only for those who continue their course in Forestry in the following session.

The H. R. MacMillan Prize in Forest Harvesting—A prize of \$100, the gift of H. R. MacMillan, Esq., C.B.E., D.Sc., LL.D., will be awarded to the student graduating with highest standing in the Forest Harvesting option.

The Kapoor Singh Scholarship in Forestry—Through the generosity of Mr. Kapoor Singh Siddoo, a scholarship of \$250 is offered annually to students in Forestry. The award will be made to a worthy student, deserving of assistance, with high academic standing (First Class).

MacMillan, Bloedel and Powell River Scholarships for Forestry.—As on page 74.

Prince George Forestry Scholarship—A scholarship of \$200, donated by the Industrial Forestry Service Ltd., is offered annually to a graduate of Prince George High School or College who has at least second class standing in Grade XIII or First Year Forestry. It will be awarded by the University of B.C. Scholarship Committee on the recommendation of a special committee chosen from Industrial Forestry Service Ltd., the B.C. Forest Service in Prince George, and a local Prince George industrial concern. Applications should be submitted to the University of British Columbia by May 31st. If no student qualifies the amount of the scholarship will be contributed to the Prince George Forestry Loan Fund and will be available for loan without interest to any student in forestry.

The Rayonier Canada (B.C.) Limited Scholarship in Forestry—A scholarship of \$500, the gift of Rayonier Canada Limited, is offered annually to students in the Third Year of the B.S.F. course who are proceeding to the Final Year. The award will be made to the student whose record in the Third and lower years of Forestry is, in the opinion of the Faculty, the most outstanding. Other factors being equal, however, preference will be given to the son or daughter of an employee of the Company.

S. M. Simpson Memorial Scholarship—As on page 24.

Ted Johnson Scholarship in Forestry—In memory of Edward (Ted) William Johnson, who lost his life in September, 1964, prior to continuing his studies

in Fourth Year Forestry, his classmates and friends have established a scholarship. This scholarship, in the amount of \$50, will be awarded to the student in the Wildlife Option in Forestry, who is an active member of the Forest Club, and who obtains the highest average and is entering the Fourth Year of Forestry. A minimum standing of Second Class is required.

The Truck Loggers' Association Scholarships—As on page 88.

The William McMahan Scholarships—As on page 52.

In Home Economics

The Agnes Merle Turnbull Scholarship—A scholarship in the amount of approximately \$170, endowed by Mrs. Agnes Graham Turnbull in honour of her daughter, Agnes Merle Turnbull Porter, is offered annually to the highest ranking student in First Year Home Economics who is proceeding to the Second Year.

The B.C.D.A. Scholarship in Dietetics—A scholarship of \$100, the gift of the British Columbia Dietetic Association, will be awarded annually to a student in the graduating year who has taken a dietetic major. The award will be made to a student who has high academic standing, and has shown potentialities for success in her chosen field. Those eligible shall be proceeding to a dietetic internship in Canada and shall indicate intention of continued practice in the field of dietetics.

The British Columbia Parent Teacher Federation Scholarship—As on page 41.

The Dr. Alice Ravenhill Memorial Scholarship—This scholarship of \$200, established from the bequest of the late Dr. Alice Ravenhill, will be awarded to the student obtaining highest standing in the Second Year of the Home Economics Course and proceeding to the next year.

The Lillian Mae Westcott Prize—This prize will be awarded annually to the senior student in Home Economics who has been outstanding in the areas of clothing and textiles throughout her course.

The Mary Graham Holland Scholarship for Home Economics—A scholarship of \$700, endowed from a bequest made by the late Mrs. Mary Graham Holland, will be awarded annually to a woman student who has completed her Third Year and is entering upon the Fourth or Fifth Year of study at this University in the School of Home Economics or in any other school or faculty in which instruction in home economics is offered. This scholarship will be given to the student considered by the School of Home Economics to be the most deserving of the award.

The Russell Food Equipment Limited Scholarship—A scholarship of \$350, the gift of Russell Food Equipment Limited, will be awarded annually to a high ranking student taking a dietetic major and entering the Fourth Year in the School of Home Economics. The award will be made to a student who has maintained high academic standing in the three previous years, has demonstrated personal qualities appropriate for a professional dietitian, has spent at least one University summer vacation in the dietary or food service department of an approved institution, and will complete professional preparation through internship. The selection of the winner will be made by the School.

The Singer Company of Canada Ltd. Prize—A portable electric Singer Sewing Machine, the gift of the Singer Company of Canada Ltd., will be

awarded to a high ranking student in the graduating class in Home Economics who has shown originality and skill in the field of clothing and who intends to enter the field of teaching. The prize will be awarded on the recommendation of the School of Home Economics.

The Vancouver and District Home Economics Association Scholarship—As on page 90.

The Vancouver Women's Canadian Club Scholarship in Home Economics—A scholarship of \$100, the proceeds of a fund created by the Vancouver Women's Canadian Club, will be awarded for general proficiency in the work of the Third Year of the Home Economics course to a student proceeding to the Fourth Year of that course.

In Law

The Allan S. Gregory Memorial Prize—Prizes totalling \$200, the gift of Ladner, Downs, Ladner, Locke, Clark and Lenox, will be awarded annually to the two students in Third Year Law, who, in the opinion of the Faculty, have displayed greatest merit in Moot Court work. A first prize of \$125 will be paid to the most outstanding student and a second prize of \$75 will be paid to the other student.

Best Printer Co. Ltd. Prizes in Law—Three prizes of \$50 each, the gift of Best Printer Co. Ltd., Vancouver, are offered annually in the Faculty of Law to worthy and deserving students with good overall academic standing. These prizes, plus certain case books produced by Best Printer Co., will be awarded to the students obtaining highest standing in Legal System (Law 108, First Year), Mercantile Law (Law 217, Second Year), and Wills and Trusts (Law 328, Third Year) respectively.

The Boughton, Anderson, Dunfee & Mortimer Prize in Law—A prize of \$50, gift of Boughton, Anderson, Dunfee & Mortimer, Barristers and Solicitors, Vancouver, B.C., is offered annually in the Faculty of Law. It will be awarded to a student in the Faculty with a good academic record and with proficiency in a field or fields of legal studies.

Campney, Owen & Murphy Scholarship—A scholarship of \$250, gift of Campney, Owen & Murphy, Barristers and Solicitors, Vancouver, B.C., is offered annually in the Faculty of Law. It will be awarded to a student with an outstanding academic record.

The Canada Law Book Company Prizes—A book prize to the value of \$25, the gift of the Canada Law Book Company Limited, is available annually for students in each year of the Law course. The awards will be made to students obtaining high marks in one or more courses.

The Canada Permanent Mortgage Corporation Prize—A prize of \$50, the gift of the Canada Permanent Mortgage Corporation, will be awarded annually to the student in the Third Year of Law obtaining the highest standing in the course on Mortgages.

Canada Permanent Trust Company Prize in Trusts—A prize of \$100, the gift of Canada Permanent Trust Company, will be awarded to the student in the Third Year of Law obtaining the highest standing in the course on Trusts.

The Carswell Company Limited Prizes—The Carswell Company Limited, Law Publishers, Toronto, offers annually three book prizes of the value of \$35 each. Of these prizes, one will be awarded in each year of the Law course to the student obtaining highest standing in that year.

The Class of Law '53 Scholarship Fund—A scholarship of \$200, gift of the Class of Law '53, will be awarded to a student in Law. The winner will be selected on the basis of scholastic achievement combined with need for financial assistance. Contributions from members of the Class are used to provide the annual scholarship and to establish a fund for maintaining the scholarship in the future.

The Diana and P.AE Irving Scholarship Trust Fund—From this fund, bequeathed by the late Diana Ogilvy Irving, two scholarships of \$1000 each, will be awarded annually to students entering the First Year of Law. The scholarships will be awarded by the Joint Committee on Prizes, Scholarships and Bursaries, designated as the Trustees, to deserving students of promise and distinction, who without financial assistance would have difficulty in pursuing their studies. Preference is given to native born British Columbians. Provided the winner maintains good academic standing and is in need of assistance, his award may be renewed in each of the Second and Third Years.

The Farris, Farris, Vaughan, Taggart, Wills & Murphy Scholarship—A scholarship of \$200, gift of Farris, Farris, Vaughan, Taggart, Wills & Murphy, Barristers and Solicitors, Vancouver, B.C., will be offered in the Faculty of Law. It will be awarded to a student with an outstanding academic record.

The Griffiths, McLelland & Co. Prize in Torts—This prize of \$100, the gift of Griffiths, McLelland & Co., Barristers and Solicitors, is offered annually to the student in Law obtaining the highest standing in the law of torts.

The Harper, Gilmour, Grey & Co. Scholarship—This scholarship of \$100, the gift of Harper, Gilmour, Grey & Co., Barristers and Solicitors, Vancouver, B.C., will be awarded annually for proficiency in the First Year of Law.

The H. Carl Goldenberg Book Prize—This book prize, the gift of H. Carl Goldenberg, Esq., O.B.E., Q.C., LL.D., Montreal, Que., will be awarded annually to a deserving student in the Faculty of Law.

The Hon. R. L. Maitland Memorial Scholarship—A scholarship of \$280, initiated by the Primrose Conservative Club of Vancouver on behalf of friends of the late Hon. R. L. Maitland, K.C., will be awarded to the student who attains the highest standing in the Second Year of the Law course and is proceeding to the Third Year of that course.

The Insurance Company of North America Prize in Insurance Law—H. C. Mills Memorial Award—A prize of \$200, gift of the Insurance Company of North America, is offered annually in the Faculty of Law. It will be awarded to the student obtaining the highest standing in the final examinations in the subject of Insurance Law. In the event of a tie, the award will be divided.

Judge Schultz Prize in Criminal Law—A prize of \$100, the gift of His Honour Judge William A. Schultz, a Judge of the County Court of Vancouver, will be awarded to the student in the First Year of Law who obtains highest standing, as determined by the final examinations, in the subject of Criminal Law.

The Ladner Prizes in Law—Prizes to the total of \$100, the gift of Leon J. Ladner, Esq., Q.C., will be awarded annually to students in the Faculty of Law. The awards will be made on the recommendation of the Faculty to students who have obtained high standing either in special fields or in the whole year's work.

The MacIntyre Memorial Fund—To honour the memory of Malcolm M. MacIntyre, Professor in the Faculty of Law at this University from 1948 to 1964, and to pay tribute to his outstanding abilities as a teacher, his kindness and generosity to students, and his exceptional courage and devotion to duty, members of the legal profession, colleagues, and students have established a fund providing an award, at present in the amount of approximately \$100, to be presented annually to a promising student proceeding to Second or Third Year Law. The award will be made to a student who, though not necessarily among the leaders of his class, is in the opinion of the selection committee deserving of financial assistance.

The Norman MacKenzie Prize in Public International Law—In honour of Dr. Norman MacKenzie a prize of \$125, established and endowed by an anonymous donor, is offered annually to the student in Law obtaining the highest standing in Public International Law.

The Panvini Scholarship Fund in Law—The income on a bequest from the late Frank Panvini provides scholarships and bursaries annually for students in the Faculty of Law. Awards will be made, by the Joint Faculty Committee of the University and the Dean of the Faculty of Law, to students with outstanding academic records, or with high scholastic standing combined with need for financial assistance.

The Robie L. Reid Scholarship—This scholarship, gift of Sutton, Braidwood, Morris, Hall & Sutton, Barristers and Solicitors, Vancouver, B.C., is in honour of the memory of Robie L. Reid, K.C., who served with W. A. Sutton, Q.C., and other predecessors of the present firm and won distinction for his scholarly interest in Canadian literature and history. In the amount of \$200, it will be awarded annually to an outstanding student in the Faculty of Law.

The Russell & DuMoulin Scholarship—A scholarship of \$400, the gift of Russell & DuMoulin, Barristers and Solicitors, Vancouver, B.C., will be awarded annually to an undergraduate in Law. The winner will be selected on the basis of hard work and achievement coupled with need for financial assistance.

Special Book Prize—A book prize of the value of \$25, the gift of an anonymous donor, will be awarded in May to a student in the Second Year who obtains high scholastic standing and is not the recipient of another scholarship or prize.

The Superior Courts Judges' Scholarship—A scholarship of \$300, provided by Members of the Court of Appeal and the Supreme Court of British Columbia, is offered annually in the Faculty of Law. It will be awarded on the basis of proficiency to a student who has completed the First or Second Year with high standing and is proceeding to the next higher year. At the discretion of the Faculty the sum may be divided to provide two scholarships of \$150 each.

The Thomas Francis Hurley Prize—A prize of \$100, gift of Isaac Shulman, Esq., in memory of Thomas Francis Hurley, is offered annually in the Faculty of Law. It will be awarded on the recommendation of the Faculty to the student presenting the best essay or report on a subject relating to the ethical problems and practice of criminal law. The details of the competition will be announced at the beginning of the session by the Faculty.

In Librarianship

The Dorothy M. Jefferd Scholarship—A scholarship of \$200, the gift of Mr. Arthur H. Jefferd, is offered annually to students entering the School of Librarianship in the course for the B.L.S. degree. In each year it will be awarded to a student with high academic attainments who, in the opinion of the Faculty, has outstanding qualifications for success in the field of librarianship. In accepting this scholarship, the University pays tribute to Dorothy Jefferd who, from 1915 until her recent retirement as Head of the Catalogue Division, served the University Library and the University with remarkable devotion and distinction.

The H. W. Wilson Scholarship—A scholarship of \$350, gift of the H. W. Wilson Foundation, Inc., New York, is offered for three years, beginning with the session 1964-65, in the School of Librarianship. The winner will be selected by the School on the basis of academic record, ability, and promise of success in the field of librarianship.

The Marian Harlow Prize in Librarianship—A cash prize of approximately \$25 will be awarded to a student in the graduating class of the School of Librarianship. The prize will not necessarily be awarded annually. It will be given to that student who has demonstrated leadership and academic or research ability in studies relating to special librarianship.

In Medicine

The B.C. Federation of Women Doctors Scholarship in Medicine—A scholarship of \$100, the gift of the B.C. Federation of Women Doctors, is offered annually in the Faculty of Medicine to a woman student who has completed at least one year of the medical course. It will be awarded to a student who has high standing, and shows promise of success in the medical profession. The winner will be selected by the Faculty of Medicine in consultation with the University Scholarship Committee.

The Borden Company, Limited, Prize in Paediatrics—A prize of \$100, the gift of the Borden Company Limited (Toronto), is offered annually in the Faculty of Medicine. It will be awarded annually to the student in the Third Year obtaining the highest standing in paediatrics.

British Pacific Life Insurance Company Scholarships in Medicine—Two scholarships of \$125 each, the gift of the British Pacific Life Insurance Company of Vancouver, are offered annually to students in Medicine proceeding from the Third to the Final Year. They will be awarded, on the recommendation of the Faculty, to students who have a better than average academic record, have shown promise and ability in the medical field, and who require financial assistance.

The Charles Leonard Gorvich Memorial Scholarship—To honour the memory of Charles Leonard Gorvich, Fairview Branch No. 178 of the Royal Canadian Legion offers annually a scholarship of \$100. This scholarship will be awarded on the basis of academic merit to an outstanding student who has completed pre-medical requirements and is continuing studies in First Year Medicine.

Ciba Company Limited Medical Prize—This prize, gift of Ciba Company Limited (Dorval, Quebec), consists of five volumes of medical illustrations on the nervous system, reproduction system, and digestive system. It is awarded annually on the recommendation of the Faculty of Medicine.

The Ciba Prize in Psychiatry—A prize of \$100, the gift of Ciba Company Limited, Montreal, is offered annually to students in the Final Year of the course leading to the degree of M.D. it will be awarded to the student who is considered to be the most outstanding in the subject of psychiatry. The award will be made on the recommendation of the Department.

The College of Physicians & Surgeons Medical Entrance Scholarship—A scholarship of \$750 a year for two years, the gift of the College of Physicians & Surgeons of British Columbia, is offered annually in competition to students entering First Year Medicine, University of B.C. It will be awarded by the Faculty of Medicine to a student with outstanding academic and other qualifications. Renewal of the award for the Second Year will be subject to maintenance by the winner of good standing during the First Year.

Crown Zellerbach Canada Foundation Scholarship in Medicine—A scholarship of \$600, the gift of Crown Zellerbach Canada Foundation, will be awarded annually to a student who has completed at least the first two years in Medicine and is proceeding to his Third or Fourth Year. Selection of the winner will be made by the Faculty on the basis of academic record, character and personality, and promise in his chosen field.

The C. V. Mosby Company Prizes—Five prizes, each consisting of the choice of a book up to the value of \$30, are offered annually by The C. V. Mosby Company, Toronto, Ontario, to medical students showing excellence or promise in a field or fields of their studies. Names of winners will be announced at the end of the session.

The Dean M. M. Weaver Medal—A silver medal, awarded initially by the late Dean M.M. Weaver on the occasion of the graduation of the first class in Medicine and now made possible by him through a permanent endowment, will be awarded annually to a student in the graduating class whose record and progress throughout the four years have been outstanding.

The Dr. A. B. Schinbein Memorial Scholarship—This scholarship of \$250 was established by Mrs. A. B. Schinbein and Dr. John E. Schinbein in memory of Austin Birrel Schinbein, O.B.E., M.B., F.A.C.S., F.R.C.S. (Canada), who was for many years Chief Surgeon at Shaughnessy Hospital and Consulting Surgeon at Vancouver General Hospital. Dr. Schinbein was outstanding in his profession and, as a member of Senate and the Board of Governors of this University, took an active part in the establishment of the Faculty of Medicine. This scholarship is awarded annually to the medical student of the Fourth Year obtaining the highest standing in the subject of surgery.

The Dr. A. E. Trites Memorial Prize—From a fund, established by friends and colleagues of Dr. A. E. Trites to honour his memory, a prize of \$150 is offered annually to the student in the Third Year with highest standing in Obstetrics and Gynaecology. The award will be made on the recommendation of the Department.

The Dr. A. M. Agnew Memorial Scholarship—To honour the memory of Dr. Alec M. Agnew, first Head of the Department of Obstetrics and Gynaecology, this scholarship of the annual value of \$200 has been established by his friends, colleagues, and family. It will be awarded to the student in the Final Year who is most proficient in Obstetrics and Gynaecology.

The Dr. Frank Porter Patterson Memorial Scholarship—This scholarship of \$150 has been established by the Primrose Club of Vancouver in memory of the late Dr. Frank Porter Patterson, Chief of Orthopaedic Surgery at the Vancouver General Hospital and one-time member of the Board of Governors of the University of British Columbia. It will be awarded to a student graduating from the Faculty of Medicine who, in the Fourth Year, has meritoriously pursued the course in surgery and displayed a special interest in orthopaedic surgery, and is proceeding to his internship.

Dr. Ernest Roland Myers Scholarship Fund—This fund, a bequest from the late Dr. E. R. Myers, provides annual scholarships for promising and deserving students who are pursuing studies in the Faculty of Medicine and who merit financial assistance. The awards will be determined at the discretion of the Joint Faculty Committee on Prizes, Scholarships and Bursaries.

The Dr. H. A. Henderson Memorial Medal—A silver medal, the gift of friends and colleagues in memory of Dr. H. A. Henderson, will be awarded to the student recommended by the Department who has demonstrated proficiency and promise in Obstetrics and Gynaecology in the Third Year.

The Dr. H. L. W. Turnbull Memorial Scholarship—In memory of Dr. H. L. W. Turnbull (1880-1950) and in testimony of his marked devotion to the study and practice of medicine as a measure of help to men and women, this scholarship has been founded by his family. The scholarship has a value of \$500 and will be awarded annually to the student in the Faculty of Medicine who completes the Second Year with the highest aggregate standing in the pre-clinical subjects and is proceeding to a higher year.

The Dr. J. Meredith Graham Memorial Prize—This prize of \$50, given as a memorial to Dr. J. Meredith Graham, will be awarded to the student or students in the Second Year of the Faculty of Medicine who, in the opinion of the Staff, have outstanding records in the academic and practical programmes of that year.

The Dr. Lachlan Neil MacKechnie Memorial Entrance Scholarship—As a memorial to Dr. L. N. MacKechnie (1863-1926), a modest, highly esteemed and self-effacing man, who first practised his profession in Victoria and Vancouver as early as 1893, and as a tribute to his devotion in public and private life, a scholarship has been established by his widow, Mrs. L. N. MacKechnie, and family. This award in the amount of \$500 is offered annually to students entering First Year Medicine, University of British Columbia, with consideration not only of academic standing, but also of character, financial circumstances and the promise of success in a medical career.

The Dr. Lavell H. Leeson Memorial Scholarship—As a memorial to Dr. Lavell H. Leeson, and as a tribute, both to his devotion to the study and practice of medicine and also to his public and private friendships, a scholarship has been established in the Faculty of Medicine by his family, colleagues and friends. This scholarship, in the annual amount of \$100, will be awarded by the Faculty to a student with high academic standing who shows promise in his chosen profession.

The Dr. Peter H. Spohn Memorial Prize—As a memorial to Dr. Peter Howard Spohn, F.R.C.P. (C), who lost his life in a drowning accident in 1960, and as a tribute to the high esteem in which he was held, his many friends and colleagues have endowed a prize in the field of paediatrics. A

former student of the University of British Columbia, a graduate in Medicine of Toronto and, at the time of his death, Associate Clinical Professor of Paediatrics in the Faculty of Medicine at this University and Chief of the Paediatric Service at St. Paul's Hospital, Dr. Spohn had won the respect and admiration of those in his profession, not only for his enthusiastic leadership, but also for his energetic interest in the special field of adolescent medicine. The prize, in the amount of \$150, will be awarded annually to a student in the graduating class who is outstanding in paediatrics.

The Dr. Wallace Wilson Leadership Award—An award to the value of \$100, given in appropriate form such as books, has been established and endowed by Dr. Wallace Wilson. It is offered annually to a graduate of the Faculty of Medicine of the University of British Columbia who, in the ten years following graduation, has demonstrated high ethical standards and outstanding leadership to the profession. In making this award factors such as professional community leadership, teaching, research, and personal participation in postgraduate education will be considered. The selection of the winner will be made by the Dean of the Faculty of Medicine and the Medical Alumni.

The Dr. Walter Stewart Baird Memorial Prize—This prize of \$50, the gift of Mrs. W. S. Baird and Mrs. W. C. Gibson, will be awarded annually in the Faculty of Medicine to the student presenting the best graduation dissertation.

The Dr. W. A. Whitelaw Scholarship—As a memorial to Dr. W. A. Whitelaw his family has endowed a scholarship of \$250 which is offered to a student in the Final Year of Medicine who has good scholastic standing and needs financial assistance.

Dr. W. T. Kergin Memorial Scholarship—As a memorial to Dr. William Thomas Kergin and as a tribute to his fine personal qualities and outstanding public service in the practice of his profession, this scholarship of \$250 has been established in the Faculty of Medicine. It will be awarded to an undergraduate with a good academic record who is worthy and deserving of financial support. In making the award, preference will be given to students from Northern British Columbia or the Upper Coastal areas.

The Elizabeth K. Craig Memorial Scholarship—A scholarship of \$300 established as a memorial to Mrs. Charles E. Craig (B.A., U.B.C., 1942) by her husband, sisters, and brother, is offered to a graduate or undergraduate student who has a good academic record and shows ability and promise for research in medical fields. The award will be made to a student undertaking directed research in the summer period or in the winter session in the area of cancer or in some other area where medical investigation is important to human welfare.

The Hamber Scholarships in Medicine—Three scholarships of \$750 each, the gift of the late Honourable Eric W. Hamber, C.M.G., B.A., LL.D., Chancellor of this University from 1944 to 1951 and Chancellor Emeritus from 1951 to 1960, are offered annually to students in the Faculty of Medicine. One of these scholarships will be awarded to the top ranking student in the Final Year who is proceeding to an internship. The other two will be awarded to top ranking students proceeding to the Final Year.

The Hamish Heney McIntosh Memorial Prize—This prize, the gift of William George McIntosh, Vancouver, in memory of his brother, Dr. Hamish Heney McIntosh, will be awarded to the student in the Final Year of Medicine who, in the opinion of the Faculty, is best qualified in every respect to practice his profession. The prize consists of specially bound volumes of Cushing's "Life of Sir William Osler".

The Health Officers' Prize in Preventive Medicine and Public Health—A cash prize of approximately \$100, provided from a fund established and maintained by donations from the Health Officers of British Columbia, will be awarded to a student in the graduating class of Medicine who has been selected by the Department of Preventive Medicine, Faculty of Medicine, after consultation with the Health Officers' Council of British Columbia. The prize will not necessarily be awarded annually. It will be given to that student who has demonstrated leadership and academic or research ability in Public Health and Preventive Medicine during his time as an undergraduate medical student at this University.

The Hoffmann-La Roche Limited Scholarship—This scholarship of \$200, the gift of Hoffmann-La Roche Limited, Montreal, will be awarded to an outstanding student for proficiency in pharmacology.

The Horner Prize and Gold Medal—This medal, known as the "Horner Gold Medal", and a cash prize of \$100, is awarded annually by Frank W. Horner Limited of Montreal, to the Fourth Year student with the highest aggregate standing in the four-year course in Medicine.

The H. Rocke Robertson Prize in Surgery—In recognition of the contribution made to the Faculty and to the Department of Surgery by Dr. Rocke Robertson, as first Professor and Head of Surgery, this prize is awarded annually to the Third Year student showing outstanding ability in the field of surgical studies.

The Ingram & Bell Limited Prize—A prize donated by Ingram & Bell Limited, Vancouver, will be awarded to a student in the graduating class of the Faculty of Medicine. This prize will be awarded to the student who, in the opinion of the Faculty, has the best overall qualifications in terms of standing, interest and participation in student affairs, character, and promise.

Irving Clinic Medical Entrance Scholarship—An award of \$500, consisting of a scholarship of \$250 and a bursary-loan of \$250, is offered annually by Irving Clinic, Kamloops, to a student entering First Year Medicine. It will be awarded to a student in Kamloops School District No. 24 who has resided in that area for five years. The winner will be selected on the basis of academic standing, promise of success in medical studies, and need for financial assistance by the Medical Screening Committee of the University of B.C., in consultation with the Irving Clinic. The bursary-loan portion of the award is to be repaid by the recipient one year after he has completed his medical training (including internship). If, in any year, there is no qualified candidate, the amount of the scholarship will be placed in the Irving Clinic Scholarship Fund and may be used, with the consent of the donors, to provide additional awards in a future year to assist previous winners in higher years of their medical course, or for similar purposes.

The Janet Hatfield Medical Scholarship—A scholarship of the annual value of \$200, the gift of Miss Janet Hatfield of Vancouver, is available for a student in the Faculty of Medicine. It will be awarded on the recommendation of the Joint Faculty Committee on Prizes, Scholarships, and Bursaries to a student who has a good academic record, has shown promise and ability in the medical field, and is worthy of financial assistance.

The Jean Guskin Memorial Scholarship—This scholarship, in memory of Jean Guskin, pays tribute to her outstanding qualities of character and honors her unselfish devotion to her family, friends and associates. Estab-

lished by her husband and the firm of Aljean of Canada Limited, in the amount of \$1000, it is awarded annually to a graduate or undergraduate in Medicine whose academic record and personal attributes indicate promise of achievement in the treatment or investigation of human diseases, especially cancer. The winner will be selected by the Faculty.

The J. R. Neilson Memorial Book Prize—This award, in the amount of \$50, for the course Surgery 450, has been established by a friend of the late Dr. Neilson to commemorate his services to the Faculty of Medicine in its formative stages and particularly in the field of paediatric surgery.

Lederle Medical Student Research Fellowships—These awards, provided by Lederle Research Division, American Cyanamid Company, enable selected students to devote their summers to research in the pre-clinical departments. Selection is made by the Faculty.

The Louis Lipsey Toohill Scholarships—From a fund established by a bequest from the late Louis Lipsey Toohill, four scholarships of \$500 each are available annually for students in the Faculty of Medicine. In accordance with the terms of the bequest the Joint Faculty Committee on Prizes, Scholarships, and Bursaries gives preference to students requiring financial assistance and showing aptitude for study related to research in cancer, arthritis and rheumatism.

Mead Johnson of Canada Ltd. Prize in Paediatrics—A prize of \$100, the gift of Mead Johnson of Canada Ltd., is offered annually in the Faculty of Medicine. It will be awarded to the student in the Fourth Year obtaining highest standing in Paediatrics.

The M. M. Weaver Prizes in the History of Medicine—A prize or prizes to the total of approximately \$75, endowed by the late Dr. M. M. Weaver, first Dean of Medicine at this University, will be awarded annually to the student or students in the Faculty of Medicine who submit the best essays on topics in the history of medicine. It is the expressed desire of the donor that the prizes be used by the winners for the purchase of books, selected in consultation with the instructors of the course.

The M.S.A. Medical Entrance Scholarships—Two scholarships, each of \$750 a year for two years, are awarded annually to students beginning studies in the Faculty of Medicine toward the M.D. degree. The awards will be made, on the recommendation of the Dean of Medicine and the Medical Screening Committee, to two students selected on the basis of outstanding academic achievement, promise, and personal qualities. Renewal of the scholarship in the Second Year will be subject to maintenance of satisfactory standing and progress.

The M.S.I. Medical Entrance Scholarship—A scholarship of \$1000, the gift of B.C. Medical Services Incorporated, is offered to students beginning studies in the Faculty of Medicine toward the M.D. degree. The scholarship will be awarded to a student selected on the basis of outstanding academic achievement, promise, and personal qualities. The winner will receive the award in two annual instalments of \$500 each, payment of the second instalment being subject to maintenance of good standing in the First Year. Selection will be made by the Dean and the Screening Committee.

The Myron M. Weaver Memorial Scholarship—The Medical Board of the Vancouver General Hospital has established an annual scholarship of the value of \$200 as a tribute to the services, leadership and inspiration

given by the late Dr. M. M. Weaver as first Dean of Medicine of this University. This scholarship, which serves as a recognition of Dr. Weaver's special interest in the values which the humanities and the arts can contribute to medical training and the practice of medicine, will be awarded to the student in the Second, Third, or Fourth Year of the course who in the opinion of the Faculty of Medicine has best exemplified these values and contributed to their realization within the Faculty.

The Okanagan Medical Entrance Scholarships—A scholarship of \$500 a year for two years, the gift of the medical staffs in the Okanagan Valley, is offered annually to students entering First Year Medicine, University of B.C. The winner will be selected by the Faculty of Medicine on the basis of academic distinction and promise of success in a medical career. The financial circumstances of those considered may be a factor in the selection. Renewal of the award for the second year will be subject to maintenance by the winner of good standing during the First Year. It is the hope of the donors and the University that the recipient of this award will, if circumstances permit, contribute to the maintenance and perpetuation of this fund when he has completed his training.

The Osler Society of Vancouver Scholarship—This scholarship of \$200, the gift of the Osler Society of Vancouver, will be awarded annually to the student or students who are proceeding to the Fourth Year and who, in the opinion of the Faculty, have the most outstanding records in the study of Internal Medicine.

The Richard and Mary Legh Trophy—This trophy is awarded annually to the undergraduate class in medicine considered by the Faculty to have made the best all-round contribution during the academic year. The trophy remains in the permanent possession of the Faculty.

The Richard Owen Memorial Prize—As a memorial to Richard Owen, a member of the Class of 1962 who, in the summer of 1960, lost his life in an accident, a fund has been established by his friends in the Faculty of Medicine to provide a prize. This prize will be awarded annually to a student with outstanding personal qualities who has achieved high rank in the first two years of the medical course.

The Samuel and Rebecca Nemetz Memorial Scholarship—This scholarship of \$200, the gift of the Hon. Mr. Justice N. T. Nemetz, in memory of his parents, Samuel and Rebecca Nemetz, will be awarded in 1966 and alternate years in the Faculty of Medicine to a student in the graduating class who, in his Final Year, has shown special aptitude for medical research.

The Sandoz Prize in Pharmacology—This prize, the gift of Sandoz Pharmaceuticals, Division of Sandoz (Canada) Ltd., Montreal and consisting of an otoscope-ophthalmoscope combination, will be awarded annually in the Faculty of Medicine to the student obtaining the highest standing in Pharmacology.

The Signus Club of Vancouver Prize—A prize of \$100, donated by the Signus Club of Vancouver in honour of its founder, Mrs. William McDougall Holland, is offered annually in the Faculty of Medicine. It will be awarded to the graduating student who, in the opinion of the Faculty, has submitted the best graduation thesis on a subject in the field of nervous diseases, with preference to the field of cerebral palsy.

The Vancouver Medical Association Medical Entrance Scholarship—A scholarship of \$500, to be known as the John Mawer Pearson Scholarship,

provided by the Vancouver Medical Association, will be awarded annually to a promising student entering First Year Medicine who is worthy and deserving of assistance. The award will be made on the recommendation of the Dean and the Screening Committee of the Faculty of Medicine.

The Vancouver Women's Canadian Club Scholarship in Medicine—This scholarship of \$100, endowed by the Vancouver Women's Canadian Club, has been established as a memorial to the Honourable Tilly Jean Rolston, Minister of Education for the Province of British Columbia from August 1, 1952 to October 12, 1953, and first woman cabinet minister with portfolio in Canada. In establishing this award, the Vancouver Women's Canadian Club pays tribute to her fine personal qualities, her distinguished public service, and her outstanding contributions in education and other fields. This scholarship is offered annually to a student in the Faculty of Medicine who not only attains high standing but who also shows promise of ability in research.

The V.G.H. Department of Psychiatry Attending Staff Prize—This prize of \$75, given annually by the Attending Staff of the Department of Psychiatry of the Vancouver General Hospital, will be awarded to the student who is generally the most proficient during his Third Year. The award will be based on examination results and on clinical ability judged on performance during the academic year.

The W. S. Berryman Memorial Scholarship Fund—This fund, established in memory of her husband by the late Mrs. Berryman, provides an annual scholarship of approximately \$250 for a worthy and promising medical student or students needing financial assistance. It will be awarded by the Joint Faculty Committee on Prizes, Scholarships and Bursaries from among the applicants who submit applications for bursaries.

In Music

The Eileen R. Gilley Soroptimist Award in Music—A scholarship of \$100, the gift of the Soroptimist Club of New Westminster, will be offered in the session 1966-67 to students resident within the territorial limits of the Club. It is open to students entering Music for the first time and majoring in Piano.

The Friends of Chamber Music Scholarship—A scholarship of \$100, gift of the Friends of Chamber Music, is offered to a student proceeding to a degree in Music. The award will be made to a promising student who shows special interest in the field of Chamber Music.

The Friends of Victoria Nagler Scholarship—A scholarship of \$100, established by the friends of Victoria Nagler, is available annually to students who are proceeding to the degree of B.Mus. at this University and who have completed at least one year of the prescribed programme. The award will be made on the recommendation of the Head of the Department to a worthy and deserving student selected on the basis of ability, proficiency, and promise.

The Henry Ohlman Scholarship—This scholarship of \$100, the gift of Mr. Henry Ohlman, is offered to a student in any year of the course leading to the degree of B.Mus. It will be awarded to the student whose major instrument is the clarinet and who, in the opinion of the Faculty, has the best overall record in the total programme of the year.

The Janine Elizabeth d'Estrubé Scholarship—This scholarship, established by Dr. and Mrs. P. F. d'Estrubé, is dedicated to the memory of their young daughter Janine Elizabeth in recognition of her particular sensitivity to, and

love for, music. It will be awarded annually by the Department of Music to a student of woodwind instruments, preferably the clarinet. The selection will be based on performing ability, scholarship, financial need, and promise of success.

The Maurice Taylor Scholarship in Music—This scholarship of \$450, established by a bequest from Elizabeth Brydone Taylor and initiated by her husband, the late Maurice Taylor, will be awarded annually to a student specializing or majoring in music at this University. The award will be made to a student with high standing who shows continuing promise of ability and interest in the field of music.

Prize for Musicology—A \$25 prize will be awarded to a student in his Third or Fourth Year of the Bachelor of Music programme who has shown an interest in and aptitude for research in Musicology. If in any one year there is no suitable candidate, the prize will not be awarded.

Proficiency Scholarship in Music—This scholarship of \$100, gift of an anonymous friend of music, will be awarded to a Second, Third, or Fourth year student in the Bachelor of Music programme on the basis of high standing, character, financial need, musical proficiency and promise.

Radio Station CHQM Scholarships in Music—Two scholarships of \$500 each, one for a woman and the other for a man, are offered by Radio Station CHQM, Vancouver, to students proceeding from the Third Year to the Final Year. The winners will be selected on the basis of outstanding scholarship in the field of music and promise of success in this field.

The Thea Koerner Memorial Scholarship—As on page 25.

The Vancouver Symphony Society Scholarship in Music—A scholarship of \$200, the gift of the Vancouver Symphony Society, will be awarded in the session of 1966-67 to a student in the degree programme in Music. The winner is selected by the Department.

In Nursing

Crown Zellerbach Canada Foundation Scholarship in Nursing—A scholarship of \$500, the gift of Crown Zellerbach Canada Foundation, will be awarded to a student who is entering the Final Year of the degree course in Nursing. Selection of the winner will be made on the recommendation of the School of Nursing. In selecting the winner consideration will be given to the records of candidates in both the academic and practical programmes, and to their promise in the profession of nursing.

The Greater Vancouver District Registered Nurses Scholarship—A scholarship of approximately \$350 is provided annually by the Greater Vancouver District, RNABC, for a member of the RNABC who, having satisfactorily completed First Year of the Postbasic Degree Programme, is proceeding toward the degree of Bachelor of Science in Nursing or who has been admitted to the Diploma programme in "Administration of Hospital Nursing Units". The award will be made in September and, in selecting the winner, consideration will be given to academic standing, nursing ability, and financial need.

The Hamber Scholarship in Nursing—A scholarship of \$300, the gift of the late Honourable Eric W. Hamber, C.M.G., B.A., LL.D., Chancellor of this University from 1944 to 1951 and Chancellor Emeritus from 1951 to 1960, is available annually to students entering the Final Year of the degree

course in Nursing. This scholarship will be awarded to a top-ranking student who has an outstanding record in both the academic and practical programmes.

The Mary Graham Holland Scholarship in Nursing—A scholarship of approximately \$750, endowed from a bequest made by the late Mrs. Mary Graham Holland, will be awarded annually to a woman undergraduate entering upon her Final Year in the School of Nursing at this University. The scholarship will be given to the student considered by the School to be the most deserving of the award.

The Pearl MacKenzie Scheel Scholarship in Nursing—A scholarship of approximately \$250, established and endowed by a bequest from the late Pearl MacKenzie Scheel, is awarded annually to students in Second Year Nursing. It will be awarded on the recommendation of the School to a student with high standing.

The Provincial Health Branch Scholarship—The Health Branch of the Province of British Columbia offers the sum of \$100 to be given as a scholarship in Nursing. This scholarship will be awarded in September to a student proceeding to the Final Year of the degree programme who, on completion of the course, will seek employment as a public health nurse.

The University Nurses' Club Scholarship—A scholarship of \$100, gift of the Nursing Division of the University of British Columbia Alumni Association will be awarded annually to a student proceeding from the Third to the Fourth Year in Nursing. In selecting the winner, consideration will be given to academic standing, ability, promise, and financial circumstances.

University Scholarship in Nursing and Health—A scholarship of \$200 will be awarded for general proficiency in previous work of university grade (which must include a minimum of two years' work in the Province of British Columbia), to a student proceeding to the Second Year of the course in Nursing who has successfully completed all First Year requirements and has demonstrated the potentialities of a good nurse.

The Vancouver Women's Canadian Club Scholarship in School of Nursing—A scholarship of \$100, the proceeds of a fund created by the Vancouver Women's Canadian Club, will be awarded to the student who attains the highest standing in all previous work and is entering the Final Year of her course in the School of Nursing.

In Pharmacy

The Bristol Award—This award, given by Bristol Laboratories of Canada and consisting of the latest edition of the *Modern Drug Encyclopedia and Therapeutic Index*, will be awarded to an outstanding student of the graduating class in Pharmacy.

The Burroughs Wellcome Scholarship—A scholarship of \$250, the gift of Burroughs Wellcome & Co. (Canada) Ltd., will be awarded annually to a student in the Faculty of Pharmacy who, in the opinion of the Dean of the Faculty, shows outstanding ability and is worthy of financial assistance.

The Canadian Foundation for the Advancement of Pharmacy Scholarships—Scholarships of \$100 each, the gift of the Canadian Foundation for the Advancement of Pharmacy, are available for students in Pharmacy. The number of scholarships depends upon the registration. Although awards will be made primarily on merit, financial need will be considered.

The Canadian Pharmaceutical Association Prize—A prize, consisting of the *Compendium of Pharmaceutical Specialties (Canada)*, is offered annually by the Canadian Pharmaceutical Association. This prize will be awarded by the Faculty of Pharmacy to a student who has been outstanding in the Pharmaceutics course of the Third Year.

The Charles E. Frosst Scholarship—This scholarship, of \$250, is offered by Charles E. Frosst and Co. of Montreal for annual award to a student of special promise and ability in the Faculty of Pharmacy. Students entering the Final Year of the degree course are eligible to compete and the award is made on the basis of scholarship, leadership, and financial need.

The Cunningham Prize in Pharmacy—A cash prize of \$100, the gift of the late George T. Cunningham, will be awarded to the student in Pharmacy whose scholastic record in all years of the course has been the most outstanding.

The Cunningham Scholarship in Pharmacy—A general proficiency scholarship of \$250, the gift of the late George T. Cunningham, will be awarded annually to the student obtaining highest standing in the Second Year of Pharmacy and proceeding to the Third Year of the course.

The Dean E. L. Woods Memorial Prize (donated by the Pharmaceutical Association of the Province of British Columbia)—A cash prize of \$50, the gift of the Pharmaceutical Association of the Province of British Columbia, will be awarded annually to a student completing the Final Year. The award will be made on the recommendation of the Dean of the Faculty to the student whose record during the entire course, in both the practical and theoretical parts of the pharmaceutical subjects, is considered to be the most outstanding.

The Edith and Jacob Buckshon Memorial Prize—A prize of \$100, given by Buckshon's Pharmacy in memory of Edith and Jacob Buckshon, is open to students in the Faculty of Pharmacy. It will be awarded to the student in the Final Year with the highest marks in the laboratory course in compounding and dispensing.

The Merck Sharp & Dohme Awards—Through the generosity of Merck Sharp & Dohme of Canada Limited, Montreal, two awards, each consisting of the Merck Index, the Merck Manual, and \$25, are available annually for students in Pharmacy. The awards will be made to the two students obtaining the highest standing in Pharmaceutical Chemistry.

National Drug and Chemical Company of Canada Ltd., B.C. Drugs Division Scholarship—A scholarship of \$200, the gift of National Drug and Chemical Company of Canada Ltd., B.C. Drugs Division, will be awarded annually to the student who obtains highest standing in the examinations of First Year Pharmacy and is proceeding to the Second Year.

The Pharmaceutical Association of the Province of British Columbia Scholarship—A scholarship of \$250, the gift of the Pharmaceutical Association of the Province of British Columbia, will be awarded annually to the student obtaining the highest standing in the examinations of Third Year Pharmacy and who is proceeding to the Fourth Year.

The Pharmaceutical Association of the Province of British Columbia Entrance Scholarship—A scholarship of \$100, the gift of the Pharmaceutical Association of the Province of British Columbia, will be awarded to a student entering First Year Pharmacy. The award will be made to the student with the highest entrance qualifications, as determined by his standing in the examinations of Senior Matriculation or First Year Arts or Science.

The Poulenc Gold Medal—A gold medal, presented by Poulenc Limited, Montreal, will be awarded annually to the student graduating in Pharmacy with the highest standing in the Pharmacology course.

The Poulenc Scholarship in Pharmacy—A scholarship of \$250, the gift of Poulenc Limited, Montreal, will be awarded annually to the student who has the most outstanding record in the biological sciences courses of the First and Second Years and who is proceeding to the Final Year in Pharmacy.

The W. Elgin Turnbull Memorial Scholarship—By a gift of his family, a scholarship in Pharmacy has been established in memory of W. Elgin Turnbull (1912-1941,) who was a member of the pharmaceutical profession in British Columbia. This scholarship to the value of \$125 will be awarded annually on the basis of general proficiency, particularly in the practical aspects of pharmaceutical subjects of the Second Year. Preference will be given to a student showing aptitude in pharmaceutical economics and, in particular, merchandising.

In Physical Education and Recreation

The Alice Bishopric Memorial Book Prize—A book prize of \$25, in memory of Mrs. Alice Bishopric, is awarded annually to the student in the Second or Third Year of the B.P.E. degree course with the highest standing in the biological sciences.

The Fruehauf Trailer Company Scholarships—A scholarship or scholarships to the total of \$400, the gift of Fruehauf Trailer Company of Canada Limited, Dixie, Ontario, may be offered in the School of Physical Education and Recreation. The awards will be made to one or more students, on the basis of good scholarship and demonstration of all-round leadership qualities, who show special interest in health, particularly in the preventive field, and who have need for assistance.

The J. J. McRae Memorial Book Prize—A book prize of \$25, in memory of J. J. McRae, will be awarded annually to a student in the B.P.E. degree programme with general academic proficiency who has made a contribution to youth work. Special consideration will be given to a student who has worked with the blind or other handicapped groups.

The Leonard Osborne Memorial Book Prize—A book prize of \$25, in memory of J. Leonard Osborne, will be awarded annually to a student in the B.P.E. degree programme with general academic proficiency, and high standing in basketball or soccer courses.

The Lieutenant James Douglas Hamilton Book Prize—A book prize, in memory of Lieutenant James Douglas Hamilton, a graduate in Physical Education and a former member of the C.O.T.C. of this University, who, on April 13, 1952, was killed in action in Korea, is offered by the Physical Education Alumni and Undergraduate Societies. The award is open to Third Year students in Physical Education showing academic and physical proficiency in the course.

Physical Education Book Prize—A book prize of \$25 to commemorate the visit of the Royal Air Force Gymnastic team is awarded annually (for a period of seven years) commencing in 1961 to a student in the First or Second Year of the B.P.E. degree course with general academic proficiency and high standing in gymnastics.

In Rehabilitation Medicine

The Helen Grimmer Scholarship in Physiotherapy—A scholarship of \$125, the gift of the Business and Professional Women's Club of New Westminster, is offered annually to women students beginning or continuing studies in Physiotherapy in the School of Rehabilitation Medicine at the University of B.C. The scholarship will be awarded to a student with a good academic record and with promise in the field. Financial circumstances may also be a factor in the award. Special preference will be given to students residing in New Westminster.

In Science

The Alcan Scholarships—As on page 45.

Allied Chemical Canada Scholarship—A scholarship of \$250, plus tuition fees, the gift of Allied Chemical Canada Ltd., will be awarded to an outstanding student entering his final undergraduate year. It is open to students continuing in honours chemistry or chemical engineering.

The Andrew H. Hutchinson Scholarship in Biology and Botany—A scholarship of \$200 per annum was endowed (through the University Development Fund) by Alumni, the Vancouver Rotary Club and friends of Dr. Andrew H. Hutchinson, upon the occasion of his retirement as Head of the Department of Biology and Botany (1916-1954), in recognition of his years of devoted service to his students, to his Department and to the University. The award will be made in the fall to a promising student who has entered the Third Year (or, exceptionally, the Fourth Year) with First Class standing in biological subjects and is registered for Honours or major studies in the Department of Biology and Botany.

The Armstead Prize in Biology and Botany—A prize of \$100, the gift of Mrs. Daniel M. Armstead, will be awarded to a graduating student in an Honours Course of the Department of Biology and Botany. The winner will be recommended on the basis of scholastic achievement and promise of ability in research.

The ASARCO Scholarship—This scholarship of \$500, gift of the American Smelting and Refining Company, is offered to a student in the Third or Fourth year of Honours Geology or Geological Engineering. The applicant, who must be a male citizen of the United States or Canada, will be selected by the Department on the basis of scholastic standing and leadership in his chosen field. He must be in good health and without physical disability and be in the top 35% of his class scholastically. An additional grant of \$500 is made to the University to the Department of Geology for its teaching programme.

B.C. Fish and Game Protective Association, Lower Mainland Zone, Scholarship—A scholarship of \$150, the gift of the B.C. Fish & Game Protective Association, Lower Mainland Zone, is offered to a student (graduate or undergraduate) in the Department of Zoology who is continuing studies in game management. The award will be made to the student who, in the opinion of the Department, has the best record in the practical and theoretical aspects of game management and needs financial assistance to continue his studies.

The Burbidge Scholarships (donated through the Men's Canadian Club of Vancouver)—Two scholarships of \$125 each, the gift of Mr. P. W. Burbidge, will be awarded for general proficiency in an Honours Course in Physics, or

in Mathematics and Physics. These awards will be made to the two students obtaining highest standing in the examinations of the Third Year and proceeding to the Final Year.

Canadian Society of Exploration Geophysicists Scholarship—The Canadian Society of Exploration Geophysicists Scholarship of \$350 in Geophysics or a related field is offered annually to a male student entering the Third or Fourth Year of a four year course in the sciences, physics, or engineering, or to a student continuing postgraduate studies in Geophysics or a related field after attaining a Bachelor's degree.

The Chemical Institute of Canada Book Prizes—Two book prizes of the value of \$25 each, the gift of The Chemical Institute of Canada, are offered to students entering the Final Year. Of these prizes, one will be awarded to the student obtaining highest standing in Chemistry in the Third Year of the Faculty of Science and the other to the student obtaining highest standing in the Third Year of Chemical Engineering.

Chevron Standard Limited Undergraduate Scholarships—Two scholarships of \$500 each, the gift of Chevron Standard Limited are available annually to outstanding students at the University of British Columbia proceeding to the year designated. The awards will be made, one in each of the following fields: (1) Honours Geophysics-Physics, Honours Geophysics-Geology, Engineering Physics (Geophysics Option), Geological Engineering (Option II-Geophysics), Geophysics-Geology (Major Programme) (tenable in the penultimate or final year); (2) Geology, Geological Engineering (Options I, II, III), Geology and Physics (tenable in the final year). In making the awards consideration will be given to scholarship, character, personality and potential ability for leadership. These awards are intended to encourage an interest in oil exploration and production and, where possible, students showing an interest in these fields will be given special consideration. Applications must be submitted by April 30th.

The Canadian Forestry Association of B.C. Scholarship—As on page 78.

The Daniel Buchanan Scholarship in Mathematics—As a memorial to Daniel Buchanan, Dean of the Faculty of Arts and Science (1928-1948), and Head of the Department of Mathematics (1920-1948), and in recognition of his teaching and research in Mathematics, Alumni and friends (through the Alumni-U.B.C. Fund), together with members of the Department of Mathematics, have established a scholarship fund. From this fund a scholarship of \$180 is offered annually to the student who gains the highest standing in the Third Year of an Honours Course in Mathematics and proceeds to the Final Year in that course.

The David E. Little Memorial Scholarship—This scholarship of \$100, a memorial to David Edmund Little, B.Sc., M.A., whose graduate work in Physics was taken at the University of British Columbia, is offered annually by his wife. It will be awarded to a student graduating in Physics. The award will be made to a student on the basis of academic proficiency and promise in research.

The Dr. John Allardyce Memorial Scholarship—This scholarship honours the memory of Professor William John Allardyce, B.A., M.A. (U.B.C.), Ph.D. (McGill), one of the pioneer members of the University who was a student during the period 1914 to 1919, interrupted by service during the First World War, and a member of the Staff from 1919 to 1931 and from 1938 to 1964. Established by his wife and family, this award pays tribute to his outstanding

service through teaching and research and to his fine personal qualities which endeared him to his students and colleagues. In the amount of \$100 annually, this scholarship will be awarded to a student for excellence in the physiological aspects of biology.

The Entomological Society of British Columbia Book Prize—A book prize, the gift of the Entomological Society of British Columbia, will be awarded to an undergraduate who distinguishes himself in entomology. The award will be made on the recommendation of the Department of Zoology.

The Fisheries Association of B.C. Scholarships—Four scholarships of \$300 each, or three awards of \$400 each, the gift of the Fisheries Association of B.C., are offered to students in the field of fisheries. Normally these awards will be available to undergraduates proceeding from the Second to the Third Year and to students proceeding from the Third to the Fourth Year. They may be given, however, to students beginning or continuing graduate study at this University. Awards will be made on the basis of interest, promise, and ability in the field of fisheries; character and personal qualities; and academic standing. To be eligible a candidate must be intending to pursue a career in some area of fisheries. Winners will be selected by a committee consisting of the Head of the Department of Zoology, the Director of the Institute of Fisheries and the Chairman of the Scholarship Committee in consultation with a committee of the Association.

The Joel Harold Marcoe Memorial Scholarship—As a memorial to Joel Harold Marcoe, who attended the University from 1961 to 1963, this scholarship has been established by his brothers, Dr. K. D. Marcoe of Vancouver and Dr. M. Marcoe of Houston, Texas. In the amount of \$100, it will be awarded annually by the University to a student who has completed the First Year of Science and is proceeding to the Second Year of a B.Sc. programme. The award will be made to a deserving student with high academic standing.

The Joseph P. Ruffel Scholarship in Science—A scholarship of at least \$600, established and endowed by Joseph P. Ruffel, Parksville, is offered annually to a male student beginning or continuing undergraduate or graduate studies at the University of British Columbia in a field of pure or applied science. It will be awarded to a student who has an outstanding academic record and who shows promise of success in his chosen field.

The Kit Malkin Scholarship—This scholarship honours the memory of Christopher (Kit) Malkin, who, after a distinguished undergraduate career, graduated from the University of B.C. with First Class Honours in Zoology. In the amount of \$500, it will be awarded annually to a student with an outstanding record in the biological sciences who is deserving of financial assistance. To mark Kit's special interest, both as an undergraduate at the University of B.C. and as a graduate student at Stanford, where he tragically lost his life, preference will be given to a candidate continuing studies or research in marine biology.

Later Chemicals Scholarship—A scholarship of \$100, the gift of Later Chemicals Ltd., is offered annually to Canadian students in the field of entomology. The award will be made on the recommendation of the Department of Zoology to a student who has high academic standing, shows promise in the field of entomology, and is continuing at the University with studies in this field. Preference will be given to a student in the field of pesticide research. If, in any year, no student qualifies for the award, the

amount of the scholarship will be available to the Department for laboratory equipment related to entomology. The award will not be made to the same student more than once.

Lefevre Gold Medal and Scholarship—As on page 11.

The Loraine Schwartz Prize in Statistics and Probability—In memory of Dr. Loraine Schwartz, Assistant Professor in the Department of Mathematics, 1960-65, this prize has been established by her friends and colleagues. It will be awarded annually on the recommendation of the Department to an undergraduate or graduation for distinction in the fields of statistics and probability.

The Louis Ware Senior Scholarship—This scholarship, gift of International Minerals & Chemical Corporation (Canada) Limited, is offered to an outstanding student proceeding to the senior undergraduate year who has an expressed interest to enter graduate school in pursuit of a Ph.D. degree. In the amount of \$1000, it will be awarded to a student proceeding to the B.Sc. or B.A.Sc. degree in any of the mineral sciences, excluding honours or majors in metallurgy (except those in Option 1), the petroleum sciences, petroleum geophysics, and paleontology. The recipient will be eligible to compete for a Ph.D. fellowship of \$3000 per year. The winner will be selected by the Department of Geological Engineering and Department of Geology.

MacMillan, Bloedel and Powell River Limited Scholarships for Forestry—Two scholarships of \$500 each, the gift of MacMillan, Bloedel and Powell River Limited, are offered to students in Arts or Science who are preparing to enter Forestry in the following session. Awards will be made on the basis of academic standing, personal qualities and interest in the field. Preference will be given to candidates whose homes are in or near Alberni, Campbell River, Chemainus, Duncan, Kelsey Bay, Ladysmith, Nanaimo, Parksville-Qualicum, Port Hardy, Powell River, Squamish, or Port Alberni. Students who wish to be considered for these scholarships should apply to the Dean of Inter-Faculty and Student Affairs by March 15th.

The Mallinckrodt Chemical Works Limited Prize—A cash prize of \$50, the gift of Mallinckrodt Chemical Works Limited, will be awarded annually to the student in the Third Year who, in the opinion of the Department of Chemistry, is most outstanding with respect to achievement and promise in the fields of inorganic and analytical chemistry.

Northern Electric Undergraduate Scholarship—The Northern Electric Company Limited offers a scholarship to assist deserving students to obtain a university education in the fields of electrical engineering, mechanical engineering, engineering physics, honours physics, honours mathematics and physics, engineering and industrial engineering. This scholarship is in the amount of tuition, laboratory and incidental fees, and books, to a maximum of \$500 for the academic year. It is open to Canadian citizens and landed immigrants who have successfully completed at least one year of undergraduate studies at a recognized university. A minimum overall average of 75% in the previous academic undergraduate year is required. Selection of the winner will be made by the University.

The Prince George Scholarship—As on page 54.

Schlumberger of Canada Scholarship—As on page 51.

The Society of Chemical Industry Merit Awards—Two merit awards, each consisting of an inscribed gold key and a year's subscription to the publica-

tion entitled "Chemistry and Industry" are offered annually by the Society of Chemical Industry, Canadian Section, to members of the graduating classes. They will be given, one in Honours Chemistry (or Honours Chemistry and Physics) and the other in Chemical Engineering, to the students achieving highest standing in these fields in the Final Year.

The Stephen Kenneth Nelson Memorial Scholarship—As on page 51.

The Truck Loggers' Association Scholarships—As on page 88.

University Scholarship in Science—A scholarship of \$200 will be awarded to each of the students obtaining highest standing in the First, Second, and Third Year respectively.

The W. H. MacInnes Scholarship in Physics and Mathematics—A scholarship of \$250, the gift of Mr. W. H. MacInnes of Vancouver, is offered annually to the student obtaining highest standing in the Second Year and proceeding to the Combined Honours Course in Physics and Mathematics.

In Social Work

The British Columbia Association of Social Workers Prize—The British Columbia Association of Social Workers offers annually a prize of \$100 to the student in First Year Social Work who is regarded by the Faculty as the best all-round member of the class.

Child Welfare Scholarship Fund—A fund known as the Child Welfare Scholarship Fund, consisting of voluntary contributions from Parent-Teacher Associations, has been established through the British Columbia Parent-Teacher Federation. Monies collected are presented annually to the University of B.C. for distribution by the Dean of Inter-Faculty Affairs in consultation with the Director of the School of Social Work. Awards are made preferably to students proceeding to the Master's degree in Social Work and who, upon graduation, plan to serve in Public Welfare in British Columbia. One of the factors in making awards is the need for financial assistance.

Greater Vancouver Branch, British Columbia Association of Social Workers, Prize—A book prize of the value of \$25, the gift of the Greater Vancouver Branch, British Columbia Association of Social Workers, will be awarded annually to a student taking a Master's degree in Social Work. The award will be made on the basis not only of academic standing, but also on all-round professional activity and promise. Selection of the winner will be made on the recommendation of the School.

The Catholic Children's Aid Society Scholarship in Social Work—To commemorate its Fiftieth Anniversary, celebrated on August 25th, 1955, the Children's Aid Society of the Catholic Archdiocese of Vancouver has established an annual scholarship of \$400. This scholarship is available to a Roman Catholic student entering the First Year of Social Work at this University. In making the award, consideration will be given to academic standing, ability, personal qualities, and promise. The award will be made by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries, in consultation with the School of Social Work. Any student who wishes to be considered for the award may apply by letter addressed to the Director of the School of Social Work, University of British Columbia, Vancouver 8, Canada. This letter should be submitted at the time application is made for admission to Social Work.

Neil Douglas McKay Scholarship—Established by Ruby McKay and friends, this fund provides an annual scholarship of \$1500 for a student who, through

the First Year, has demonstrated skill in work with children and their families, and who is entering Second Year. Preference will be given to a student whose stated purpose is to practice in the field of public welfare.

The Laura Holland Scholarship—The friends and associates of Laura Holland, desiring to recognize her distinguished service in the field of Social Work to British Columbia and to Canada in general, have, through a special committee, endowed a scholarship. This scholarship of \$380 will be awarded annually to the student in Social Work who is entering the Second Year and whose record in the First Year is the most outstanding. Students proceeding directly from the First Year to the Second Year or returning from a period of employment after the First Year are eligible for consideration.

The Moe and Leah Chetkow Memorial Prize—A prize of \$100, established by a bequest to the University from Moe and Leah Chetkow, will be available for a student completing the final year of lectures in the course leading to the degree of M.S.W. The award will be made on the basis of proficiency in Social Work studies and on the recommendation of the School of Social Work.

The Social Work Prize—A prize of \$100, the gift of the Social Work Staff, is offered annually to the student presenting the best thesis in fulfilment of the requirements for a Master of Social Work degree.

The Zella Collins Scholarship Fund—This scholarship of the annual value of \$100, established by a bequest from Laura Holland in honour of Zella Collins, will be awarded annually to a student or students beginning or continuing studies in the School of Social Work at this University. The award will be made on the recommendation of the School, to those who are deemed worthy and deserving.

High School Graduation and Grade XIII Scholarships

The A. J. Mouncey Memorial Scholarship—To honour the memory of Ada J. Mouncey, founder and for many years Director of Shurpass Pacific College, and to pay tribute to her generosity and devotion in helping others, this scholarship has been established by her colleagues, students, and friends. It will be awarded annually to a student of the College who is proceeding in the fall to a full programme of Second Year studies at the University of British Columbia. The award will be made to a student selected on the basis of high academic standing and outstanding personal qualities. Candidates will be recommended by the College to the University.

The Alan W. Neill Memorial Scholarship—To honour the memory of Alan W. Neill, who represented with distinction the constituency of Comox-Alberni in the Parliament of Canada for over twenty-four years, this scholarship has been established by his daughter, Helen D. Stevens. In the amount of \$300, it will be offered annually to a student resident in the Comox-Alberni Electoral District who is proceeding from Grade XII or XIII to studies at the University. It is intended to give needed assistance to an able student whose personal qualities, character, and achievement show him or her to be worthy and deserving of support. Applicants should apply by completing the General Application for Scholarship Form. This form must be received by the University not later than May 15th. All candidates must write the scholarship examinations conducted in June by the Department of Education.

The Annie B. Jamieson Scholarship—Established as a memorial to Annie B. Jamieson, B.A., LL.D., a scholarship of \$150 will be awarded annually to

a student entering the University from Grade XII or XIII of a Vancouver High School. Applicants must write the Departmental Examinations in June, should have high scholastic standing and should show evidence of those qualities of character which make for leadership in community affairs and in interest in world events. By this award it is hoped to perpetuate the spirit of public interest and public service which Miss Jamieson embodied during a pioneer period of the city's development, and especially to give recognition to her distinguished contributions as a teacher in the Vancouver Schools, and as a member of the Vancouver School Board, the Public Library Board, and the Senate and Board of Governors of the University of British Columbia. The fund supporting this scholarship was contributed by friends and associates of Miss Jamieson; it was augmented by contributions made in memory of the late Victor Osterhout, at his own request. Applications are required by May 15th.

Bralorne Pioneer Mines Limited Scholarships—Bralorne Pioneer Mines Limited offers annually to sons or daughters of employees of Bralorne Pioneer Mines Limited, graduating from Grade XII or Grade XIII, several scholarships of \$150 each. These scholarships will be awarded to promising and deserving students continuing their studies beyond the high school level at the University or some other educational institution providing post high school education. Applicants who wish to be considered must complete the General Application Form which may be obtained from the University. This application form must give details of the applicant's proposed plans for study, and the application form should be forwarded to Dean Walter H. Gage, University of B.C., Vancouver 8, B.C., not later than May 31. Awards will be made only to candidates whose proposed plans of study and whose standings are sufficiently satisfactory.

British Columbia Forest Products Limited Entrance Scholarships—Eight scholarships of \$400 each are offered by British Columbia Forest Products Limited to sons and daughters of employees who, by June 30th of the year in which the award is made, have or will have served the Company for at least one year. They are open to students proceeding in the fall from Grade XII or Grade XIII to a full course of studies at the University of British Columbia, University of Victoria, or Simon Fraser University. Candidates for these scholarships must write a full set of scholarship examinations conducted in June by the Department of Education, B.C. The scholarships will be awarded to the eight candidates obtaining highest standing. No award will be made, however, to an applicant with an overall average of less than 70%. Applicants for these scholarships must complete the General Application for Scholarship form, which may be obtained from the Dean of Inter-Faculty and Student Affairs, University of B.C. This application must be received by the University not later than May 15th and must contain the necessary details of family service with the Company. Before June 1st they must also complete and submit, through the school principal, the special form required by the Department of Education from all those writing the scholarship examinations.

The British Columbia Teachers' Federation Scholarships—As on page 148.

The Burrard Dry Dock Company Limited Entrance Scholarship—Burrard Dry Dock Company Limited, North Vancouver, offers annually a scholarship of \$1200 to students proceeding from Grade XII or Grade XIII to a full course of study at the University of British Columbia or Simon Fraser University in any course leading to a degree. To be eligible for consideration, a candidate must be the son, daughter, or legal dependent of (a)

an employee who has served with the Company for at least three continuous years and is still so employed when the award is initially made; or (b) an employee who, having served with the Company for at least three continuous years, has retired, or has become totally disabled, or has died. Selection of the winner will be made by the Selection Committee on the basis of academic standing and promise, interest and participation in school and community affairs, personal qualities, and other factors. Each scholarship will be paid in four annual instalments of \$300 each, subject to satisfactory standing and attendance at the University. Candidates must apply on special forms, which may be obtained from, and must be returned to, the Personnel Department of the Company before May 30th. Candidates are expected to write the Departmental Examinations in June. The application will be forwarded by the Company to the University.

The Canadian Forestry Association of B.C. Scholarship—This scholarship of \$200 will be awarded to a student who has been active in Junior Forest Warden work, has completed First Year Arts or Science or Grade XIII (Senior Matriculation), and is proceeding to First Year Forestry at this University. Students wishing to be considered for this scholarship must apply before May 15th.

The Chris Spencer Foundation Special Scholarships—Two scholarships, each of the value of \$500 a year and renewable annually for a maximum of five years (to a total of \$2500), are offered to students entering the University of British Columbia, Vancouver, from Grade XII or XIII and proceeding to a degree at this University. These scholarships, the gift of the Chris Spencer Foundation, are available only to students whose ordinary private domicile, home, or residence is in the Province of British Columbia. Applicants will require high scholastic standing. They will be considered, not only on the basis of this standing, but also on their interest and participation in activities such as sports, student government, youth groups in and out of school, and fine arts and music. Special attention will be given to the qualities developed through these activities and of indication during the period of high school, of moral force of character and of instincts to lead and take an interest in classmates. Students holding these scholarships in any year of their course will be permitted to retain them for the following year only provided they obtain an average of at least 80% in the sessional examinations or rank in the upper 10% of their class (i.e., the year and faculty in which they are registered). Selection of applicants will be made by a committee representing the Foundation and the University. Applications, on forms obtainable from the office of the Dean of Inter-Faculty and Student Affairs, should be received by April 15th and cannot be accepted after May 1st.

The Columbia Cellulose Company, Limited Entrance Scholarships—Seven scholarships, each of the value of \$250 per year and renewable annually for a maximum of five years (\$1250), are offered to students completing Grade XII in the following British Columbia communities: two are offered to students attending in Prince Rupert and in Castlegar; one each to those attending in Terrace, Nakusp-Needles, and Revelstoke. Grade XII students in these communities intending to proceed to a degree or teaching certificate in any field at the University of B.C., University of Victoria, or Simon Fraser University may apply. Programmes at other Canadian Universities will be considered on their merits. Grade XIII attendance in British Columbia will be accepted in lieu of attendance at first year University. All candidates for these awards must notify the Dean of Inter-Faculty Affairs, University of B.C., Vancouver 8, B.C., not later than May 15 of their intention to compete

by submitting the "General Application for Scholarship" form. These forms may be obtained from the University or the Industrial Relations Department of Columbia Cellulose Company, Limited. All candidates must write the full set of scholarship examinations for High School Graduation (University Programme), conducted in June by the B.C. Department of Education. The scholarships will normally be awarded to the candidates obtaining the highest standing in the June Departmental Examinations. However, they may be awarded to other candidates if those with the higher standing win other awards (Government Scholarships excluded), or they may be withheld if candidates do not obtain sufficiently high standing. To be eligible for annual renewal, students must obtain a pass in all subjects.

The Columbia Cellulose Company, Limited, Robert S. Stacey Memorial Scholarship—Established as a memorial to the late Robert S. Stacey, Co-ordinator of Industrial Relations for Columbia Cellulose Company, Limited, this scholarship is open to sons, daughters and legal dependents of full-time employees, of retired employees and of deceased employees who died while in the service of the Company. These are eligible if attending Grade XII with the intent to proceed to a degree or teaching certificate in any field at the University of British Columbia, University of Victoria, or Simon Fraser University. Programmes at other Canadian Universities will be considered on their merits. The award to the value of \$250 annually is renewable to a maximum of five years (\$1250). Grade XIII attendance in British Columbia will be accepted in lieu of attendance at first year university. All candidates for this award must notify the Dean of Inter-Faculty Affairs, University of B.C., Vancouver 8, B.C., not later than May 15 of their intention to compete by submitting the "General Application for Scholarship" form. This form may be obtained from the University or the Industrial Relations Departments of Columbia Cellulose Company, Limited. All candidates must write the full set of scholarship examinations for High School Graduation (University Programme), conducted in June by the B.C. Department of Education. The scholarship will normally be awarded to the candidate obtaining the highest standing in the June Departmental Examinations. However, it may be awarded to another candidate if the one with the higher standing wins another award (Government Scholarship excluded), or it may be withheld if candidates do not obtain sufficiently high standing. To be eligible for annual renewal, students must obtain a pass in all subjects.

Crown Zellerbach Canada Foundation Scholarship No. 1—This scholarship of \$500, offered by Crown Zellerbach Canada Foundation, is available annually to sons and daughters (or legal dependents) of employees of Crown Zellerbach Canada Limited, including Vancouver Office, Richmond Division, Ocean Falls, Elk Falls, Kelowna Division, and Crown Zellerbach Paper Co. employees in B.C. Selection of the winner will be made by the Scholarship Committee of the University on the basis of scholastic standing, leadership, citizenship, character, and interest and participation in school and community affairs. The award will be made to a student with full High School Graduation (University Programme) standing who is proceeding to studies at the University of British Columbia, University of Victoria, or Simon Fraser University. The application forms are available from the Public Relations Department of Crown Zellerbach Canada Limited, 1030 West Georgia St., Vancouver, or the Industrial Relations Department of any of the divisions. Completed application forms must be received not later than May 15th.

Crown Zellerbach Canada Foundation Scholarship No. 2—This scholarship of \$500, offered by Crown Zellerbach Canada Foundation, is available annually

to sons and daughters (or legal dependents) of employees of Crown Zellerbach Building Materials Limited in B.C., Canadian Tugboat Company Limited, Comox Logging Division, Northern Pulpwood Division, Beaty Laminated Division, Bridge Lumber Division, and S. M. Simpson Division. Selection of the winner will be made by the Scholarship Committee of the University on the basis of scholastic standing, leadership, citizenship, character, and interest and participation in school and community affairs. The award will be made to a student with full High School Graduation (University Programme) standing who is proceeding to studies at the University of British Columbia, University of Victoria, or Simon Fraser University. The application forms are available from the Public Relations Department, 1030 West Georgia St., Vancouver, or the Industrial Relations Department of any of the divisions. Completed application forms must be received not later than May 15th.

The Dairyland Credit Union Scholarship—A scholarship of \$200 is offered annually by the Dairyland Credit Union to students who are proceeding to the University of B.C. or Simon Fraser University in the fall from Grade XII or XIII in a full programme of studies leading to a degree in any field. To be eligible, an applicant must (a) be the son, daughter, grandson or granddaughter of an active member of Dairyland Credit Union; (b) write the Government Examinations conducted in June by the Department of Education, B.C., and obtain clear standing with an overall average; (c) file with the Dean of Inter-Faculty and Student Affairs a letter indicating his or her connection with Dairyland Credit Union and complete the University Bursary Form of the University of B.C. This form, which requires details of the applicant's financial circumstances and those of his or her family, must be filed with the University not later than July 15th. Candidates should note that intention of writing the Government Scholarship examinations must be filed with the Department of Education, Victoria, B.C., through the school principal, before June 1st. The Dairyland Credit Union Scholarship will be awarded to the candidate who, in the opinion of the University in consultation with the Credit Union, is best qualified in terms of academic merit and financial need.

The Delta Kappa Gamma Scholarship—As on page 41.

The East Asiatic Company (Canada) Ltd. Entrance Scholarship—The East Asiatic Company (Canada) Ltd. offers annually a scholarship of \$500 to a first year student. This scholarship is open in competition to sons and daughters of employees of the Company and its affiliated Company, Johnson, Walton Steamships Ltd., entering the University of British Columbia, Vancouver, in the fall from Grade XII or XIII and proceeding in a full programme of studies leading to a degree in any field. Students who wish to compete must submit an application by May 31st to the Dean of Inter-Faculty and Student Affairs, University of B.C., Vancouver 8, B.C. The application must state (i) the name and address of the candidate; (ii) the names of his or her parents, who must have been employed by either of the above companies for a minimum of one full year, and brief details of their service with the Company; (iii) the school attended this session by the candidate and the grade in which he or she is registered. All candidates must write a full set of Grade XII or XIII examinations, conducted in June by the Department of Education, B.C. The award will be made to the candidate obtaining the highest standing provided a minimum overall average of 70% has been achieved in the Grade XII or XIII examinations. In the event that the candidate wins another scholarship, the University and the Company reserve the right to

decide whether the East Asiatic Company (Canada) Ltd. Scholarship shall be paid to the winner or revert to the eligible candidate with the next highest standing.

The Faculty Scholarship—A scholarship of approximately \$200, provided by donations from the Faculty, is offered to sons and daughters of Faculty members who obtain high standing in the written examinations for University Entrance and who are not winners of other major awards. The selection of the winner will be made in accordance with the terms laid down for the Chris Spencer Foundation Special Scholarships. Applications must be received not later than May 15th.

The Federation of Telephone Workers of British Columbia, Plant Division, Scholarship—The Federation of Telephone Workers of British Columbia, Plant Division, offers a scholarship of \$500 to sons and daughters of members (with at least twelve months continuous service) or of deceased members (with the same service). It is open in competition to students proceeding in the fall from Grade XII or XIII in high school to a full programme of studies at the University of British Columbia, Simon Fraser University, or University of Victoria. To be eligible for consideration a candidate must have an overall average of at least 70% in the subjects of the grade in which he or she is registered. Candidates in Grade XIII will be considered on the basis of standing obtained in the Departmental Examinations written in June; those in Grade XII will be considered on the basis either of standing received by recommendation or in the June Departmental Examinations. The winner will be selected by the University, in consultation with the Federation, from those who so qualify. In the final selection, a major factor will be the financial circumstances of applicants and their families. All candidates must apply to the University of B.C. not later than May 15th by completing the "General Application for Scholarship" form. Applications should contain details of family service with the Federation and other pertinent information.

General Motors of Canada Limited Scholarships—Under the General Motors of Canada Canadian Scholarship Programme, two scholarships are provided for students from high school beginning studies at the University of British Columbia. The programme is designed to provide young people of limited financial resources, but high scholastic ability, the opportunity to receive benefits of higher education. These scholarships are available to outstanding students selected by the University who are citizens of Canada. Winners who maintain high academic standing are eligible for renewals for three further years. The value of each award each year ranges upward from \$200 a year and is determined by the University on an individual basis. High school students in British Columbia who wish to be considered should obtain the "General Application for Scholarship" form from the Dean of Inter-Faculty and Student Affairs, University of British Columbia, Vancouver 8, B.C. The completed form must be returned to the University not later than May 15th. The application should include full information regarding the financial circumstances of the applicant and his family. Intending applicants in British Columbia should write the scholarship examinations conducted by the Department of Education, B.C., in June.

Girl Guides of Canada, Vancouver Council (Elizabeth Rogers Trust) Scholarships—Two scholarships, one of \$150 and the other of \$100, are offered by the Vancouver Girl Guides Council to students who are entering the University of B.C. in the fall from Grade XII or XIII in a full pro-

gramme of studies leading to a degree. To be eligible, an applicant must be an active member of the Girl Guide Movement in Vancouver, West Vancouver, North Vancouver (City or District), Richmond, or Burnaby. In selecting the winners the academic standing of the applicants will, and the financial circumstances of their parents may, be considered together with the applicant's interest in Girl Guide activities. Those selected to receive the awards assume a moral obligation to maintain association with the Girl Guide Movement. Winners are selected by the University in consultation with the Vancouver Girl Guide Council. Applications, on the general form available from the Dean of Inter-Faculty and Student Affairs, must be submitted to the University not later than May 15th.

Hon. W. C. Woodward University Memorial Scholarships—Two scholarships, each of the value of \$500 and renewable annually in the same amount at the beginning of each undergraduate year (up to a maximum of five payments in all) are offered in competition to sons, daughters, and legal dependents of full-time staff, retired and deceased staff (who died while employed in a Woodward's Store). These scholarships are open to applicants beginning University attendance for the first time and entering the University of British Columbia, the University of Victoria, or Simon Fraser University from Grade XII or XIII of secondary school (or from any other source, provided they are qualified for admission). The writing of the examinations conducted in June by the Department of Education, B.C., is required. Applicants must be proceeding, in any faculty, to a full course leading to a degree. Candidates, who must apply not later than May 31st using the Scholarship form obtainable from the Personnel Department of any Woodward store, will be considered on the basis of (a) academic standing; (b) activity and interest in youth programmes and organizations (within the school and community); and (c) personal qualities, character, and demonstration during attendance at school of citizenship, leadership, and service. Renewals are subject to maintenance of satisfactory standing, progress and conduct.

The Hospital Employees' Union Local 180 Scholarships—Two scholarships of \$250 each are offered annually by the Hospital Employees' Union Local 180 to students who are proceeding in the fall from Grade XII and XIII of high school to a full programme of studies at the University of B.C., University of Victoria, or Simon Fraser University in any field leading to a degree. To be eligible an applicant must (a) be the son or daughter of an active member of the Union ("active" being interpreted as on the staff of a hospital within the jurisdiction of Local 180, or on the staff as of January 1st of the year of award but since superannuated); (b) write the Government Scholarship Examinations conducted in June by the Department of Education, B.C., and obtain clear standing with an overall average of not less than 70%; (c) file with the Dean of Inter-Faculty and Student Affairs, University of B.C., a letter indicating the connection of his or her parents with the Union, and complete the University Bursary Form of the University of B.C. This form and letter must be received by the University of B.C. not later than July 15th. Candidates should note that intention to write Government Scholarship Examinations must be filed with the Department of Education, Victoria, B.C., through the school principal, before June 1st. The scholarships will be awarded to the two candidates who, in the opinion of the University (in consultation with the Union), are best qualified in terms of academic standing and financial need.

Inland Natural Gas Co. Ltd. Scholarship in Home Economics—A scholarship of \$250, the gift of Inland Natural Gas Co. Ltd., is offered annually to

students proceeding from Grade XII or XIII to a course of studies at the University leading to the degree of B.H.E. This scholarship, open to students who reside in the area served by Inland Natural Gas Co. Ltd., will be awarded on the basis of academic standing, personal qualities, character, and promise and interest in the field of Home Economics. Consideration may also be given to the financial circumstances of those who apply. Applications must be submitted by May 15th.

The International Longshoremen's and Warehousemen's Union Entrance Scholarships—Three scholarships of \$400 each are offered to members, and sons and daughters of members, in good standing, of the International Longshoremen's and Warehousemen's Union. They will normally be awarded to the candidates who obtain the highest standing in Grade XII or XIII written examinations conducted in June by the Department of Education, Victoria, B.C., and who are proceeding in the fall to a full programme of studies at the University of B.C., the University of Victoria, or Simon Fraser University. Students who wish to compete for these awards must apply on the General Application Form for Scholarships, which may be obtained from the office of the Dean of Inter-Faculty and Student Affairs, University of B.C., Vancouver 8, B.C. The completed application must be received at the University by May 15th. The donors reserve the right to withhold awards if the academic standing of candidates is not sufficiently high or to re-award scholarships if winners receive other scholarships of substantial value.

International Nickel Scholarship—As on page 21.

The I.W.A. (New Westminster) Credit Union Scholarship—A scholarship of \$250, established by the I.W.A. (New Westminster) Credit Union, is offered annually to members, or to sons or daughters or legal dependents of members, of the Credit Union who are proceeding from Grade XII or XIII to begin their studies at the University of British Columbia or Simon Fraser University. The basis of award will be a combination of high academic standing, active interest in school and community affairs, and character and personal qualities. In the case of a close decision the financial circumstances of applicants and their families will be considered. Applications, on forms obtainable from the Dean of Inter-Faculty Affairs, should reach the University not later than May 15th.

Japanese-Canadian Citizens' Association B.C. Centennial Scholarship—A scholarship of \$100, the gift of the British Columbia Japanese-Canadian Citizens' Association, is offered annually to a Japanese-Canadian student residing in British Columbia and proceeding from Grade XII or Grade XIII to a full course of study at the University of British Columbia. The award will be made on the basis of scholastic ability, character, and promise of achievement. In making the award, consideration will be given to interest and participation in extra-curricular activities. Applications for this award will be considered by the University in consultation with the Association. The June Departmental Examinations must be written. Applications must be submitted by May 15th.

The Kiwassa Club of New Westminster Scholarship—A scholarship of \$250, the gift of the Kiwassa Club of New Westminster, will be awarded annually to a woman student resident in the City of New Westminster area who is entering the University of B.C. from Grade XII or XIII of high school. The purpose of this award is to give encouragement to a worthy student who has high standing and who needs financial assistance to begin her studies at the University. Applications must be received by the University not later than May 15th.

Margaret Delmage Award—The British Columbia Parent-Teacher Federation offers annually the sum of \$200 to a son or daughter of a native Indian of British Columbia who is entering the University of British Columbia, or some College of recognized standing within the Province, from Grade XII or Grade XIII or is proceeding from Grade XII to Grade XIII and who shows promise of success in continuing studies at the university level. This award is known as the Margaret Delmage Award and is presented in honour of Mrs. Margaret Delmage as a tribute to her outstanding contribution to parent-teacher work in British Columbia. Applications must be received by the University not later than May 30th.

The Nancy Ryckman Scholarship—As on page 23.

Norman MacKenzie Alumni Scholarship Fund—Alumni contributions to the Alumni Annual Giving Campaign have made possible the establishment of forty-two Regional Scholarships, as a tribute to the outstanding contribution of Dr. Norman A. M. MacKenzie in the field of higher education in this Province, in the amount of \$350 each. These scholarships are available to students proceeding from Grade XII (High School Graduation, University Programme) or Grade XIII to the University of British Columbia. One scholarship will normally be awarded in each of the present Provincial Electoral Districts. Winners will be selected by special Alumni Screening Committees in each electoral district representing the University and the Alumni Association. Application forms may be obtained from Dean Walter H. Gage, University of B.C., Vancouver 8, B.C., and completed application forms should be received by April 15th, and cannot be accepted after May 1st. All applicants must write a full set of High School Graduation (University Programme) or Grade XIII examinations conducted by the Department of Education, British Columbia, in June, 1966.

The Pacific Brewers' Warehousing Ltd. Scholarships—Approximately twelve scholarships of \$400 each, provided by The Carling Breweries (B.C.) Limited, Lucky Lager Breweries Ltd., Molson's Capilano Breweries Ltd., and O'Keefe Old Vienna Brewing Co. (B.C.) Limited, are available annually for students who are resident in British Columbia and who are proceeding directly from Grade XII or Grade XIII to a full course of study at the University of British Columbia. Winners will be selected by the University on the basis of scholastic standing, character, and interest in school and community affairs. Preference will be given to candidates from remoter parts of the Province. To be eligible, candidates must write the full set of scholarship examinations, conducted by the Department of Education in June. Applications must be received by the Dean of Inter-Faculty Affairs at the University by May 15th.

Pacific Resins, Ltd. Customers' Scholarship—A scholarship of \$300, donated annually by Pacific Resins & Chemicals, Inc., is offered to students entering the First Year at the University of British Columbia. This award is open to students who are planning careers in the fields of chemistry, chemical engineering, forest products or wood utilization, or junior or senior high school teaching in science or mathematics. In selecting the recipient, consideration will be given to field of study, scholastic ability and academic record, need, interest and participation in school and community affairs, and personal qualities and character. Candidates must write the Departmental Examinations in June. Applications are required by May 15th.

The Percy W. Nelms Memorial Prize—This prize, a memorial to Percy W. Nelms, who, in August 1961, lost his life while engaged in construction

work in Northern British Columbia prior to entering the University of B.C. as an undergraduate, has been established by his brother and sister-in-law, Dr. and Mrs. G. LeRoy Nelms, and his relations and friends. The prize will be awarded annually to a student resident in British Columbia, north of the Peace River, who is entering the University for the first time. The winner will be selected by the University on the basis of academic ability, promise and personal qualities.

The Pharmaceutical Association of the Province of British Columbia Scholarship—As on page 69.

The Phrateres Scholarship Fund—From this fund, established and maintained by Theta Chapter of Phrateres, an international organization of college women, a scholarship of \$100 will be awarded annually to an out-of-town woman student with High School Graduation (University Programme) or Grade XIII (Senior Matriculation) standing who is attending University for the first time. The award will be made to a student of high standing. In making the award, consideration may be given to financial need.

The Plimsoll Club Entrance Scholarships (donated by Pacific Coast Terminals Co. Ltd.)—Two scholarships of \$475 each, the gift of Pacific Coast Terminals Co. Ltd., New Westminster, are offered to students who have completed Grade XII or XIII and who are beginning their studies at the University of British Columbia. These awards are available for students resident in New Westminster or surrounding districts. In selecting the winner consideration will be given not only to academic standing but also to general interest and participation in school and community activities, and to the financial circumstances of those eligible. An applicant must write the June Departmental Examinations.

Prince George Forestry Scholarship—As on page 54.

The Royal Arch Scholarships—Four scholarships, in the amount of \$300 each, have been established by the Royal Arch Masonic Order to give assistance to sons and daughters of members of Chapters in British Columbia or Yukon Territory in good standing, or of deceased members, who without assistance would be unable to continue through University. They will be awarded annually, on the basis of scholastic standing and need, to eligible students proceeding directly in the fall from Grade XII or Grade XIII to a full programme of studies at the University of British Columbia, Simon Fraser University, University of Victoria, or Notre Dame University of Nelson. Candidates for these scholarships must (a) write a full set of scholarship examinations conducted in June by the Department of Education, B.C.; (b) complete the General Application for Scholarship Form, which may be obtained from the Dean of Inter-Faculty and Student Affairs, University of B.C. This application form, which is to be received by the University not later than May 15th, must clearly indicate (i) the applicant's relationship to a member of the Royal Arch Masonic Order, the name of the member, and the name of Royal Arch Chapter in British Columbia or Yukon with which he or she was connected; and (ii) the applicant's financial circumstances and those of his or her immediate family. Only candidates who obtain an overall average of 70% in the Departmental examinations will be considered. If, in the opinion of the University, no applicant is suitably qualified, the awards will be withheld.

The Ruth E. Cameron Memorial Scholarship—As a memorial to Ruth E. Cameron, Chief Librarian of New Westminster and for many years a

member of the Club, the University Women's Club of New Westminster awards annually a scholarship of \$250 to a woman student proceeding from Grade XII, Grade XIII, or First Year University to the next year of her course at the University of British Columbia. To be eligible for consideration, an applicant must reside in New Westminster, Burnaby, Coquitlam, Port Moody, or Surrey and have attended a school in these areas for at least the last five months of the school year immediately preceding her admission to the University. In making the award, consideration will be given to the scholastic standing, the personal qualities and character, and the financial circumstances of applicants. At the discretion of the awarding committee the scholarship may be divided to provide two awards, one of \$150 and the other of \$100. Further information and application forms may be obtained from the office of the Dean of Inter-Faculty and Student Affairs. Applications must be received not later than May 15th.

Standard Oil Company of British Columbia Limited Entrance Scholarship
 —Standard Oil Company of British Columbia Limited offers a scholarship worth \$2000 to students who are residents of British Columbia and are proceeding in the fall to studies in the First Year at the University of British Columbia, the University of Victoria, Simon Fraser University, or other approved Canadian University of recognized standing, in a full course leading to a degree. Candidates must write a full set of scholarship examinations for High School Graduation (University Programme) conducted in June by the Department of Education, Victoria, B.C. The scholarship will normally be awarded to the eligible applicant obtaining highest standing in these examinations. Should this applicant win another award, however, the scholarship may be given, at the discretion of the University, to the eligible candidate with next highest standing. No award will be made to a candidate with an overall average less than 75%. The winner of this award will receive \$500 during the first year of attendance at the University, and is eligible for renewals of \$500 a year for three further years. Each renewal is subject to maintenance of standing satisfactory to the Selections Committee. All candidates for this award must, by May 15th, notify the Dean of Inter-Faculty and Student Affairs, University of British Columbia, of their intention to compete. Before June 1st, they must also complete and submit, through the school principal, the special form required by the Department of Education from all those writing the scholarship examinations. Postponement for one year may be granted to a student taking the equivalent of First Year through Grade XIII or at some institution other than the University of B.C., University of Victoria, or Simon Fraser University, but he must obtain satisfactory standing in that year.

Standard Oil Company of British Columbia Limited Special Scholarship
 —Standard Oil Company of British Columbia Limited offers a scholarship worth \$2000 to children or wards of employees or annuitants of the Standard Oil Company of British Columbia, or of deceased employees who died while in the employ of the Company or as annuitants of the Company, and who have or had not less than one year of service with the Company. It will be open in competition to students proceeding in the fall to the First Year at the University of British Columbia, the University of Victoria, Simon Fraser University, or other approved Canadian university of recognized standing, in a full course leading to a degree. Candidates must write a full set of scholarship examinations for High School Graduation (University Programme) conducted in June by the Department of Education, Victoria, B.C. The scholarship will normally be awarded to the eligible applicant

obtaining highest standing in these examinations. Should this applicant win another award, however, the scholarship may be given, at the discretion of the Selection Committee, to the eligible candidate with next highest standing. No award will be made to a candidate with an overall average less than 70%. The winner of this award will receive \$500 during the first year of attendance at the University, and is eligible for renewals of \$500 a year for three further years. Each renewal is subject to maintenance of standing satisfactory to the Selection Committee. All candidates for this award must, by May 15th, notify the Dean of Inter-Faculty and Student Affairs, University of British Columbia, of their intention to compete. Essential details of family service with the Company must also be supplied. Before June 1st they must also complete and submit, through the school principal, the special form required by the Department of Education from all candidates writing the scholarship examinations. Postponement for one year may be granted to a student taking the equivalent of First Year through Grade XIII or at some institution other than the University of B.C., the University of Victoria, or Simon Fraser University, but he must obtain satisfactory standing in that year.

The St. Joseph's Unit, Local 180, Scholarship—A scholarship of \$250 is offered by the St. Joseph's Unit of the Hospitals Employees' Union Local 180 to students proceeding in the fall from Grade XII or XIII of secondary school to a full programme of studies at the University of B.C., University of Victoria, or Simon Fraser University in any field leading to a degree. To be eligible an applicant must (a) be the son or daughter of an active member of the Hospital Employees' Union Local 180 ("active" being interpreted as on the staff of a hospital within the jurisdiction of Local 180, or on the staff as of January 1st of the year of the award but since superannuated); (b) write the Government Examinations conducted in June by the Department of Education, B.C., and obtain clear standing with an overall average of not less than 70%; (c) file with the Dean of Inter-Faculty and Student Affairs, University of B.C., a letter indicating the connection of his or her parents with the Union and one of the hospitals, and complete the University Bursary Form of the University. This form must be received by the University not later than July 15th. Candidates should note that intention to write Government Scholarship Examinations must be filed with the Department of Education, Victoria, B.C., through the school principal, before June 1st. The scholarship will be awarded to the candidate who, in the opinion of the University (in consultation with the Union), is best qualified in terms of academic standing and financial need.

The T. E. and M. E. Ladner Memorial Scholarship—As on page 25.

Trans Mountain Oil Pipe Line Company Scholarships—Trans Mountain Oil Pipe Line Company offers scholarships to a total of \$4500 plus an additional grant of \$500 to the University. These scholarships, ranging from \$400 to \$700 each, will be awarded to students with high academic standing in Grade XII or Grade XIII who are entering the University of British Columbia for the first time from high school. These scholarships are open to students who are proceeding to degrees in Engineering, the Physical Sciences, or Geology and who reside in areas along the route of the Trans Mountain Oil Pipe Line, i.e. lower and upper Fraser Valley, Chilliwack, Hope, Merritt, Kamloops, and the North Thompson River region. In selecting the winners, the financial circumstances of applicants, as well as their academic standing, will be considered. Winners are not normally permitted to hold other scholarships. The Company also provides the sum of \$2500 for renewals at the discretion of the University to winners with

high standing and financial need. Applicants must write the June Departmental Examinations. Applications must be submitted not later than May 15th to the Dean of Inter-Faculty and Student Affairs.

The Truck Loggers' Association Scholarships—Through a gift of \$250 from the Truck Loggers' Association, two scholarships of equal value are available for students entering First Year Forestry or Forest Engineering. These scholarships will be awarded to students with high standing who are worthy and deserving of encouragement and assistance.

UBC Chris Spencer Foundation Entrance Scholarships—Fifteen one-year scholarships of \$500 each (\$275 contributed by the Chris Spencer Foundation and \$225 by the University of B.C.) will be awarded on the results of the High School Graduation (University Programme) Scholarship Examinations conducted in June by the Department of Education, B.C. These scholarships are open only to students proceeding in the fall to a full programme of studies at the University of B.C., Vancouver. To be eligible, a candidate must, before June 1st, notify Dean Walter H. Gage, University of B.C., Vancouver 8, B.C., by completing the General Application for Scholarship

Form, that he intends to enter the University of B.C. in the fall. He must also complete and submit to the Division of Examinations, Department of Education, B.C., through his school principal, the form "Application—Scholarship Candidate", before June 1st. These scholarships will be offered as follows:

- (a) \$500 to the eligible candidate with highest standing in the Province;
- (b) \$500 to the eligible candidate with next highest standing in the Province;
- (c) \$500 to the eligible candidate with next highest standing in each of the following areas:
 - Area 1—School Districts 1 to 11 inclusive, and 18, 19;
 - Area 2—School Districts 12 to 17 inclusive, 21, 22, 23, 77, 78;
 - Area 3—School Districts 20, 24 to 31 inclusive, 57, 58, 82;
 - Area 4—School Districts 32, 33, 34, 35, 42, 75, 76;
 - Area 5—School Districts 36, 37, 38;
 - Area 6—School District No. 39 (Britannia, David Thompson, Gladstone, Killarney, Technical, Windermere, any private schools in the area);
 - Area 7—School District No. 39 (Eric Hamber, John Oliver, King Edward, King George, Sir Winston Churchill, Sir Charles Tupper, and any private schools in the area);
 - Area 8—School District No. 39 (Kitsilano, Lord Byng, Magee, Prince of Wales, University Hill, and any private schools in the area);
 - Area 9—School Districts 40, 41;
 - Area 10—School Districts 43, 44, 45;
 - Area 11—School Districts 46 to 56 inclusive, 59, 60, 80, 81, 83;
 - Area 12—School District 61;
 - Area 13—School Districts 62 to 74 inclusive, 79.

If the winner in any of the above categories receives another award, or if no candidate in a category qualifies, the University of B.C. reserves the right to award the scholarship to the candidate who, in the opinion of the University, is best qualified. Winners, when notified by the University, must confirm their acceptance immediately. Postponement will be granted on medical grounds only.

UBC Royal Institution Scholarships for Grade XIII—Six general proficiency scholarships of \$200 will be awarded by the University of B.C. on the results of the Grade XIII Scholarship Examinations conducted in June by the Department of Education, B.C. They are offered only to students who, in the fall, will attend the University of B.C., Vancouver, in a full programme of studies. To be eligible, a candidate must, before June 1st, notify Dean Walter H. Gage, University of B.C., Vancouver 8, B.C., by completing the General Application for Scholarship Form, that he proposes to enter the University of B.C. in the fall. The candidate must also complete and submit to the Division of Examinations, Department of Education, B.C., through the school Principal, the form "Application—Scholarship Candidate" before June 1st. These scholarships are offered as follows:

- (a) \$200 to the candidate of highest standing in the Province;
- (b) \$200 to the candidate of next highest standing in the Province;
- (c) \$200 to the candidate of next highest standing in all school districts of the Province other than School Districts No. 39, 40, 41, 44, and 45; and
- (d) \$200 each to the three candidates of next highest standing in School Districts No. 1 to 82 inclusive (other than Nos. 39, 40, 41, 44, 45, 61).

United Steel Workers of America Scholarships—Two scholarships of \$500 each are offered annually to students who are sons or daughters of active members of the Union residing in the lower mainland, and who are proceeding in the fall from Grade XII or XIII of secondary school to a full programme of studies at the University of British Columbia or Simon Fraser University leading to a degree in any field. Each candidate must apply by letter, received not later than June 1st, and addressed to the Secretary, United Steel Workers of America, 33 East Broadway, Vancouver 10, B.C. The letter must contain the following details: applicant's full name, address, age; name of school and grade attended; brief outline of proposed studies at the University; name and address of parent or guardian and of his or her service with the Union. Candidates must write the Departmental Examinations conducted in June by the Department of Education, B.C. Winners will be selected by the University.

University of British Columbia Employees, Local Union No. 116, Scholarship—A scholarship of \$350, the gift of the University of British Columbia Employees, Local Union No. 116, is available to sons, daughters, and legal dependents of active members having at least one year's service with the Union. This scholarship will be awarded to a student proceeding from high school to begin studies at the University in a full course leading to a degree. In the selection of the winner, consideration will be given to academic standing, character, interest and participation in school and community affairs, and financial circumstances. Applications, on forms available from the office of the Dean of Inter-Faculty and Student Affairs, must be submitted to the University not later than August 1st.

The Vancouver Elementary School Teachers' Association Scholarships—As on page 43.

The Vancouver and District Home Economics Association Scholarship—A scholarship of \$250, the gift of the Vancouver and District Home Economics Association, is open in competition to women students in Vancouver and District, who are entering the School of Home Economics at the University from Grade XII. In the selection of the winner consideration will be given to academic standing; aptitude for, and promise in, the field of home economics; personal qualities and character; and interest and participation in school and community affairs. The financial circumstances of the applicants and their families may also be a factor. Applications, on forms obtainable from the Dean of Inter-Faculty and Student Affairs, must be submitted to the University not later than May 15th.

The Vancouver Federal Employees Credit Union Harold Pocock Memorial Scholarship—A scholarship of \$350, established by the Vancouver Federal Employees Credit Union in memory of Harold Pocock, first manager and secretary of this Credit Union, is offered to sons, daughters and legal dependents of employees of the Dominion Government residing in the Vancouver area (including the City of Vancouver, the City and District of North Vancouver, and the Municipalities of West Vancouver, Burnaby and Richmond), or of persons who are eligible to become or are members of the Vancouver Federal Employees Credit Union. The scholarship will be awarded to a student completing Grade XII or XIII in high school and proceeding in the fall to the University of B.C. or Simon Fraser University in a full course leading to a degree. In selecting the winner, consideration will be given to academic standing, ability, and promise in future studies, character, and participation and interest in school and community affairs. Applications, on forms obtainable from the University of B.C., must be submitted by June 30th. In the application, the candidate must give a full account of his extracurricular activities and of his and his parents' financial circumstances.

Vancouver General Unit, Local 180, Scholarships—Two scholarships of \$250 each are offered annually by the Vancouver General Unit of the Hospital Employees' Union Local 180 to students proceeding in the fall from Grade XII or XIII of secondary school to a full programme of studies at the University of B.C., University of Victoria, or Simon Fraser University in any field leading to a degree. To be eligible an applicant must (a) be the son or daughter of an active member of the Hospital Employees' Union Local 180 ("active" being interpreted as on the staff of a hospital within the jurisdiction of Local 180, or on the staff as of January 1st of the year of the award but since superannuated); (b) write the Government Examinations conducted in June by the Department of Education, B.C., and obtain clear standing with an overall average of not less than 70%; (c) file with the Dean of Inter-Faculty and Student Affairs, University of B.C., a letter indicating the connection of his or her parents with the Union and one of the hospitals, and complete the University Bursary Form of the University. This form and letter must be received by the University not later than July 15th. Candidates should note that intention to write Government Scholarship Examinations must be filed with the Department of Education, Victoria, B.C., through the school principal, before June 1st. The scholarships will be awarded to the two candidates who, in the opinion of the University (in consultation with the Union), are best qualified in terms of academic standing and financial need.

The Vancouver Island Recreation Scholarship—A scholarship of \$150, the gift of the Vancouver Island Council of the British Columbia Recreation Association, will be awarded to a student in the degree programme in Recreation at the University. The scholarship is financed by participation of Vancouver Island Recreation Commissions. The award will be made on the basis of academic standing, leadership qualities, activity in student affairs, participation in Community activities, personal qualities, and financial need. To be eligible a candidate must have an overall average of at least 65% in the final written examinations conducted in June by the Department of Education, or for students in the University, in the final sessional examinations. The scholarship will be awarded to a student in the First Year from Vancouver Island. If there is no suitably qualified candidate in this category, preference will be given to a Vancouver Island candidate in the Second, Third, or Fourth Year in that order, and then to a First Year student from some other area of the Province. Applicants must apply on the General Application for Scholarship form, to be received by Dean Walter H. Gage, University of B.C., Vancouver 8, B.C., not later than May 15th. The letter must contain full details covering the factors on which the award is based.

The Vancouver Local Office, UIC-NES, Staff Scholarship—A scholarship of \$150, established jointly by the staff of the Unemployment Insurance Commission and National Employment Service, is offered in competition to sons and daughters of members of the staff who are contributors to the Staff Welfare Fund. It is open to eligible applicants proceeding in the fall from Grade XII or Grade XIII of high school to a full course of studies at one of the Provincial Universities, Institutes of Technology, Junior Colleges, or any other Provincial post secondary school. Selection of the winner will be made on the basis of academic standing, personal qualities, and achievement in school and community affairs. Candidates must complete the General Application for Scholarship form obtainable from the Dean of Inter-Faculty and Student Affairs, University of B.C. The completed application form must be received by the University not later than June 30th.

The Vancouver Police Force Scholarships—To encourage and assist sons and daughters of members of the Vancouver Police Force to attend the University, seven scholarships of \$250 each are offered on an annual basis by individuals, firms, and organizations as follows:

- The Wilfrid J. Borrie Scholarship (donated by Mr. W. J. Borrie);
- The J. Douglas Maitland Scholarship;
- The MacMillan, Bloedel and Powell River Limited Scholarship;
- The Police Mutual Benevolent Association Scholarship (two awards);
- The Vancouver Policemen's Union Scholarship; (two awards).

These scholarships are open in competition to the children of (1) serving members of the Force who, on June 1st of the year of the award, held a rank not above Staff Sergeant; (2) superannuated former members who, on retirement from the Force, held a rank not above Staff Sergeant; (3) members who died while serving with the Force and who, at the time of death, held a rank not above Staff Sergeant; (4) Officers of the Force, but applications will be considered only when there is not a sufficient number of qualified applicants in (1), (2), and (3) above. They are available either to students entering the University from high school (Grade XII or Grade XIII) or to those who have previously attended and are

continuing their studies at the University. Preference, however, will be given to those entering University from high school. In selecting the winners, the academic standing of the applicants and the financial circumstances of their parents will be considered. Application forms may be obtained from and must be received by Mr. R. Pickering, Secretary, Vancouver Police Force Scholarship Committee, 312 Main St., Vancouver 4, B.C., not later than June 30th.

The Vancouver Postal Club Scholarship—A scholarship of \$200 is offered by the Vancouver Postal Club to sons, daughters, and legal dependents of full-time postal employees who have or will have been employed in the Vancouver Postal Area for at least one year prior to June 30th of this year. It will be awarded by the University, in consultation with the Club, to a student entering the University from Grade XII or XIII to begin a full course of studies leading to a degree in any field. Applicants will be considered on the basis of academic standing, qualities of leadership as shown by their interest and participation in school and community affairs, and personal qualities and character. The final date for submitting applications is June 30th.

The Vancouver Real Estate Board Scholarships—Five scholarships of \$500 each are offered in competition by the Vancouver Real Estate Board to Grade XII or XIII students enrolling for full-time studies in the fall in a course of at least two years duration leading to a recognized degree, diploma, or certificate at the University of British Columbia, Simon Fraser University, or the British Columbia Institute of Technology. The parent or legal guardian of the applicant must be an Active or Financial Member, Active Associate Member, or a Member of the Salesmen's Division of the Board, and have been such for a period of not less than two years at the time the application is made. The applicant must also write a full set of examinations conducted in June by the Department of Education, B.C. Candidates with an overall average of less than 70% will not be considered. The successful applicants will be selected primarily on the basis of academic standing. Candidates for attendance at all institutions must apply by completing the General Application for Scholarship Form, which may be obtained from Dean Walter H. Gage, University of B.C., Vancouver 8. The completed form must be received not later than June 30th.

The Vancouver Sun Scholarships for Carriers—The Vancouver Sun offers annually two scholarships of \$500 each to students proceeding in the fall from Grade XII to the First Year at the University of British Columbia, the University of Victoria, or Simon Fraser University, in a full programme leading to a degree in any field. To be eligible applicants must have been carriers of The Vancouver Sun for at least two years. The scholarships will be awarded to the two applicants who rank highest on the basis of the marks obtained in the written examinations for High School Graduation (University Programme), conducted in June by the Department of Education, B.C. Applicants must write a full set of examinations in the scholarship subjects prescribed by regulations of the Department and the University. Winners who obtain and maintain First Class standing (or who, in successive years of their undergraduate course, rank in the top 10% of the Faculty and Year in which they are registered) will be eligible for renewals of \$500 a year until graduation, not exceeding a total of five payments in all. Selection of the winners will be made by the University. A student who wishes to be considered for one of these scholarships must apply by letter to Dean Walter H. Gage, University of British Columbia,

Vancouver 8, B.C., not later than May 15th. The letter of application must be accompanied by the service certificate of The Vancouver Sun. The winner of one of these scholarships, while not also permitted to hold The Vancouver Sun Special Scholarship for Carriers may, however, accept other awards offered to him.

The Vancouver Sun Special Scholarship for Carriers—The Vancouver Sun offers annually a scholarship of \$500 to students proceeding in the fall from Grade XII to the First Year at the University of British Columbia, the University of Victoria, or Simon Fraser University, in a full programme leading to a degree in any field. To be eligible an applicant must have been a carrier for the Vancouver Sun for at least two years, and must take the written examinations for High School Graduation (University Programme), conducted in June by the Department of Education, B.C. All applicants must write a full set of examinations in the scholarship subjects prescribed by the regulations of the Department and the University. An applicant will be considered only if he obtains an overall average of at least 75%. The scholarship will be awarded to the eligible applicant who, in the opinion of the University is the most outstanding in combining high scholastic attainment with achievement in one or more areas such as service to the school and community; writing, drama, fine arts; debating and public speaking; sports. A winner who, in successive years of his undergraduate course, obtains and maintains First Class standing (or who ranks in the top 10% of the Year and Faculty in which he is registered) will be eligible for renewals of \$500 a year until graduation, not exceeding a total of five payments in all. All candidates must complete the "General Application for Scholarship Form" obtainable from Dean Walter H. Gage, University of B.C., Vancouver 8, B.C. The completed application, accompanied by the service certificate of The Vancouver Sun, must be received by the University not later than May 15th. Candidates will be judged on the basis of their examination grades, their personal letters (see application form for details), and letters of recommendation from their references. The winner of this scholarship, while not also permitted to hold one of the Vancouver Sun Scholarships for Carriers, may accept other awards offered to him.

The Walter C. Koerner Scholarship in Creative Writing—This scholarship of \$500, the gift of Mr. Walter C. Koerner, is open in competition to students in Grade XII or XIII in British Columbia secondary schools beginning studies in any faculty at the University of B.C., Vancouver, in the fall of 1966. It will be awarded to a student with a good all-round academic record who shows promise in the writing of imaginative literature, particularly in the fields of poetry, prose fiction, or the drama. Candidates must apply by letter addressed to the Walter C. Koerner Creative Writing Scholarship, c/o Dean Walter H. Gage, University of B.C., Vancouver 8, B.C. The letter of application should indicate the student's school, and state briefly the student's interests and aims as a writer. It should be accompanied by a selection of the applicant's creative work (in typescript or in printed or mimeographed form). Applications must reach the University by May 15th.

W. H. MacInnes Entrance Scholarships in English—Through the generosity of Mr. W. H. MacInnes of Vancouver, scholarships of \$100, \$75, and \$50 respectively are available to the three students entering the University of British Columbia in September with highest standing in the combined subjects of English 40 and English 91. To be eligible a candidate must write the scholarship examinations conducted in June by the Department of

Education, Victoria, B.C. In the event of a tie the award will be made to the qualifying student with highest overall average. Winners of these awards will not be precluded from holding other awards given by the University.

The W. H. MacInnes Entrance Scholarships in Mathematics—Through the generosity of Mr. W. H. MacInnes of Vancouver, scholarships of \$100, \$75, and \$50 respectively are available to the three students entering the University of British Columbia in September with highest standing in Mathematics 91. To be eligible a candidate must write the scholarship examinations conducted in June by the Department of Education, Victoria, B.C. In the event of a tie the award will be made to the qualifying student with highest overall average. Winners of these awards will not be precluded from holding other awards given by the University.

The Yarrows Limited Entrance Scholarship—A scholarship of \$1200 for sons, daughters, or legal dependents of employees of Yarrows Limited, Victoria, is offered annually under terms and conditions identical to those of the Burrard Dry Dock Company Limited Scholarship. If the winner so desires, however, attendance at the University of Victoria or Simon Fraser University will be accepted in lieu of attendance at the University of B.C. Candidates must apply on special forms which may be obtained from, and must be returned to, Yarrows Limited before May 30th. Selection of the winner will be made by the University in consultation with the University of Victoria.

Extension Courses and Miscellaneous

Scholarships in the Diploma Programme of Adult Education—For each of the two years, 1966-67 and 1967-68 nine scholarships provided by the Department of University Extension and varying from \$100 to \$500 are offered to students who undertake the Faculty of Education-Extension Department Diploma Programme in Adult Education. Selection of the winners will be made by the Faculty of Education and the Department of Extension on the basis of scholastic standing, demonstrated interest in adult education and apparent ability to make a significant contribution to the field. In making the awards, financial circumstances of the candidate may also be considered. The specific amounts and terms of the awards are as follows: 2 scholarships of \$500 available to students who will be in full-time residence for one academic year; 2 scholarships of \$250 and 5 scholarships of \$100 available to resident, extra-session and summer session students.

The University Chapter, I.O.D.E., Prize in Ceramics—With the purpose of furthering study of fine arts at the University, a prize of \$50, the gift of the University Chapter, I.O.D.E., was offered in the Extension Classes in Ceramics for the best work done in that field during the session 1964-65 by a student who is proceeding to a degree in fine arts. Selection of the winner was made by the Scholarship Committee of the University in consultation with the Fine Arts Committee and the Department of Extension.

In Summer Session

The British Columbia Teachers' Federation Postgraduate Scholarships for Teachers—As on page 139.

The British Columbia Teachers' Federation Undergraduate Scholarships for Teachers—As on page 148.

The Dr. H. T. J. Coleman Scholarship—This scholarship of \$100 is offered annually in the summer session, in honour of the late Dr. H. T. J. Coleman, who contributed greatly to the development of the Summer School at the University. The award will be made by the Scholarship Committee to a student in the Third or higher year who has an outstanding record in one or more of the fields of psychology, philosophy, and education.

The Gilbert Tucker Memorial Summer Session Prize—An annual prize of \$35 is offered by the Summer Session Association in memory of Professor Gilbert Tucker, who served this University as scholar, historian, and teacher.

The award will be made to the student enrolled in a history course in summer session, who, in the opinion of the Department of History, is the most outstanding. It is available for students registered in the Third or a higher year who were not in attendance in the previous winter session.

Summer Session Association Scholarships (Extension)—Two scholarships of \$50 each will be given by the Summer Session Association to Non-Credit students in the Extension Department to be awarded on the recommendation of the Department and the President of the Summer Session Association.

Summer Session Association Prizes—Prizes of \$100 each, the gift of the Summer Session Association, will be awarded at the conclusion of each summer session to the five top ranking students who complete the final units required for an undergraduate degree by attendance at that summer session. To be eligible a candidate must have taken the final fifteen units for the degree by means of University of British Columbia Summer Session, Extra-Sessional or Correspondence Courses.

Summer Session Association Prize for Graduate Students—A prize of \$100, gift of the Summer Session Association, will be awarded at the conclusion of each summer session to the most outstanding student who completes the final units for a Master of Arts in Education or a Master of Education degree by attendance at that summer session. To be eligible, a candidate must have taken the final twelve units for the degree by means of University of B.C. Summer Session, Extra Sessional, or Correspondence Courses.

Summer Session Scholarships in Personal and Business Finance—A grant for three years, the gift of the Canadian Life Insurance Officers Association and the Canadian Bankers Association, has been made to the Faculty of Commerce and Business Administration to assist teachers from the Prairie Provinces to participate in the Summer Session Course in Personal and Business Finance. In 1964, three awards were offered for Alberta of \$200 each, three for Saskatchewan of \$250 each, and three for Manitoba of \$300 each. Awards will be made to practising secondary teachers selected by the Faculty of Commerce and Business Administration of the University of British Columbia.

STUDENT ASSISTANCE

Students who require financial assistance to continue or begin their studies at the University of British Columbia are referred to the sections of this Calendar describing the Self-Help Programme, Bursaries (in the next section), and Loans (page 127).

BURSARIES

For The Winter Session

Applications for bursaries awarded by the University and tenable in the winter session, must be received by the Dean of Inter-Faculty and Student

Affairs not later than July 15th. Application forms may be obtained at the office of the Dean of Inter-Faculty and Student Affairs after June 1st. See also "Government Bursaries" below.

Unless announced otherwise in the Calendar description, bursaries are awarded only to undergraduates who are beginning or continuing a full course of study in Vancouver at the University of British Columbia, and in special cases, to graduates taking the one-year Teacher Training Course, the one-year Library Course, or Social Work (First Year only), at this University. To be eligible for a bursary, a student must normally show evidence of financial need and have at least Second Class standing in the full year's work most recently taken.

A student applying for a University Bursary (described below) will automatically be considered as an applicant for any other bursaries given by the University. Only one bursary application is therefore required for the session. Separate application must be made, however, for any bursary aid from the Provincial Department of Education (Government Bursaries). Application forms for this assistance may be obtained from the Department of Education, Victoria, B.C., to whom inquiries should be directed.

Bursaries and Loans are not normally awarded to students entering the University for the first time from outside British Columbia. They become eligible for consideration after attending the University for a full winter session.

Government Bursaries—The Government of the Province of British Columbia (with a contribution also from the Federal Government) provides funds annually for the award of bursary assistance to selected capable persons who can show financial need and who fulfil certain requirements of being domiciled in British Columbia. These awards will be made to assist students entering their first year of undergraduate studies at the University of British Columbia, from Grade XII or XIII. If funds permit, however, awards may be made for undergraduate studies in higher years (including the one-year teacher-training course, the one-year Librarianship course, and the First Year of Social Work), or for acceptable university studies at a recognized institution outside the Province in fields for which training is not available at universities in British Columbia. Awards are normally in the range of \$100 - \$200. Applications must be submitted to the Department of Education, Victoria, B.C., by August 5th. Application forms may be obtained from the Department of Education, Victoria, B.C., from the Dean of Inter-Faculty and Student Affairs of the University of B.C., from the University of Victoria, or, where the student is attending school, from the principals of senior high schools.

University Bursaries—For the session of 1966-67 a University Bursaries Fund has been made available by the Board of Governors to enable a limited number of undergraduates to attend the University who would not otherwise be able to do so. Applications from students entering the one-year Teacher Training Course, the course in Librarianship, and the First Year of Social Work will also be considered. To be eligible for an award from this fund a student must have attained at least Second Class standing in the full year's work last taken, and must give evidence of need. Applications, on the University Bursary form available at the office of the Dean of Inter-Faculty and Student Affairs, must be received not later than July 15th.

Acadia Camp Resident's Bursary—A bursary of \$140, the gift of the Acadia Camp Residents, is offered annually to students in any year and

faculty who have good scholastic standing and need financial assistance. Preference will be given to those residing in Acadia Camp.

Agricultural Bursary (Anonymous)—This bursary of \$60 is offered in the session 1966-67 to assist a student in Agriculture from a rural area, other than the Fraser Valley, who has completed at least the First Year.

The Agriculture Women's Undergraduate Society Bursary—This bursary of \$75, gift of the Agriculture Women's Undergraduate Society, is offered to a woman student entering the Faculty of Agriculture for the first time. It will be awarded to a student on the basis of qualities of character and leadership and financial need.

The A. Johnson Bursaries—A bequest from the late Alfred Johnson provides bursaries from time to time for selected students in the United Kingdom to enter the University to proceed to an undergraduate degree. Each award, covering tuition, board and room and incidental expenses, is renewable annually until graduation, subject to satisfactory standing.

The Aline Smithson Memorial Bursary in Nursing—As a memorial to Aline Smithson (nee Lawrence) and as a tribute to her exceptional personal qualities and cheerful devotion to her family and friends, this bursary has been established by her husband, H. William Smithson. In the amount of \$100 it will be awarded annually in December to a student in Nursing who is worthy and deserving of assistance, is potentially a good nurse and really loves people.

The Allied Officers' Auxiliary Bursary—To commemorate the services and sacrifices of members of the armed forces and the merchant navies of the Allied Nations, the Allied Officers' Club Auxiliary has established a bursary of the annual bursary of \$125, open to students in any year and faculty. This bursary is available for a veteran of the Second World War or for the son or daughter of a veteran. The award will be made on the basis of scholastic standing and financial need.

Allstate Insurance Co. Bursary—A bursary of \$100 will be awarded annually to a student in the Faculty of Commerce and Business Administration, entering either the Third or Fourth Year, who has good scholastic standing, shows an interest in the area of insurance and risk management, and is in need of financial assistance.

The Alpha Gamma Delta Mothers' Club Bursary—A bursary of \$100, the gift of the Alpha Gamma Delta Mothers' Club, is offered to a woman student in any year and faculty. It will be awarded to a worthy and deserving student who needs financial assistance.

The Alpha Omega Society Bursary—This bursary of \$100, gift of the Alpha Omega Society, a University organization for students of Ukrainian descent, is offered to active members of the Society who have good academic standing, need financial assistance, and are continuing in a full programme of undergraduate studies. The recipient will be selected by the University in consultation with the Club.

The Alvin Cunningham Bursary—A bursary of \$200, the gift of Alvin Cunningham, is offered annually to a student entering the Second or Third Year of the course in Pharmacy. The award will be made on the recommendation of the Dean of the Faculty, to a student who has shown definite ability and has need of financial assistance.

The American Woman's Club Bursary—A bursary of \$250, given by the American Woman's Club of Vancouver, will be available in the session 1966-67 to assist a woman undergraduate who has completed at least one year in Arts and Science with satisfactory standing, and who cannot otherwise continue her course.

The Angus MacInnis Bursary—A bursary of \$350, the gift of the British Columbia Federation of Labour, C.L.C., is offered annually, open in competition to the sons and daughters of trade unionists. It will be awarded to an undergraduate who has completed at least one year of university studies and who is enrolling for a course in political science or labour economics and industrial relations.

The Anna E. Sprott Memorial Bursary in Nursing—This bursary of \$100, given in memory of Anna E. Sprott by the R.C.A.F. Chapter, I.O.D.E., will be awarded in the winter session to a student taking her Final Year in the course leading to the degree of B.S.N. in the School of Nursing. The award will be made to a student who has good academic standing and is in need of financial assistance.

The Anne S. Campbell Bursaries—The annual income from a fund bequeathed by the late Anne S. Campbell will be used to provide bursaries for undergraduates who show qualities of leadership and who need financial assistance.

The Annie Lipson Memorial Bursary in Social Work—A bequest to the University from Mrs. Annie Lipson provides a bursary of \$125 annually for four years. The first award was made in September, 1964. This bursary is offered to students beginning or continuing studies in the School of Social Work and will be awarded to a student with a good academic record who needs financial assistance.

The A. Rothstein Memorial Bursary—This bursary of annual value of \$100, in memory of the late Mr. A. Rothstein, will be awarded to an undergraduate in any year or faculty who has good scholastic standing and is in need of financial assistance.

The Auxiliary to the Pi Gamma Chapter of the Fraternity of Phi Gamma Delta Bursary—A bursary of \$100, the gift of the Auxiliary to Pi Gamma Chapter of the Fraternity of Phi Gamma Delta, is available annually for a male undergraduate of good scholastic standing who is in need of financial assistance.

The B.C. Beef Cattle Growers' Association Bursaries—The B.C. Beef Cattle Growers' Association has provided the sum of \$1000 for bursaries for students engaged in research on beef production.

B.C. Chapter of Alpha Delta Phi Fraternity Bursary—A bursary of \$50, the gift of the B.C. Chapter of Alpha Delta Phi Fraternity, is available for a male undergraduate in any year and faculty who has good academic standing and needs financial assistance to continue at University.

The B.C. Dental Association Bursaries—The B.C. Dental Association offers annually three bursaries of \$250, each, open to residents of British Columbia who are enrolled in the Faculty of Dentistry at the University of British Columbia. These bursaries will be awarded to students with good academic records who, in the opinion of the Committee, need, and are deserving of, financial assistance. The winners will be required to assume a moral (but not a legal) obligation to reimburse the Fund after completion of their training.

Applicants for bursaries must complete the University Bursary application form and submit it to the University not later than July 15.

The B.C. Dentists Wives Association Bursary—A bursary or bursaries to the total of \$2000, the gift of the B.C. Dentists Wives Association, are offered annually to pre-dental students proceeding in the fall to an approved Faculty or School of Dentistry. They will be awarded to worthy and deserving students at the University who have completed all pre-dental requirements, have good academic standing, and need financial assistance. Applications, on the University Bursary Form, must be received at the University by August 1st. The winners are asked to assume a moral obligation, if and when circumstances permit, to reimburse this bursary fund.

The B.C. Society of Internal Medicine Bursary—A bursary of \$550, the gift of the B.C. Society of Internal Medicine, will be awarded annually to a student or students in the Faculty of Medicine who have good scholastic standing and need financial assistance. The award is open to dependents of deceased physicians and to students proceeding to a career in fundamental medical science, or showing aptitude for and interest in a career in internal medicine. Preference will be given to students in the Final Year.

The Bella Koch Memorial Bursary—This bursary, of annual value of \$100, the gift of Mr. Albert O. Koch and family, will be awarded to a student who has good scholastic standing and who, without financial assistance, will be unable to continue studies at the University.

The Bennett & White Construction Co. Ltd. Bursaries—Bursaries to the total of \$2,000, gift of Bennett & White Construction Company, Ltd., are provided annually for deserving students in the Totem Park Residences. These bursaries will be offered each year for a period of five years, commencing in September, 1965.

The Ben Shapiro Memorial Bursary—This bursary of \$50, established in memory of Mr. Ben Shapiro by his children, provides assistance for worthy and deserving students. It will be awarded to a student in any year and faculty who has good standing and requires some financial aid.

Best Printer Co. Ltd. Bursary in Animal Science—A bursary of \$150, the gift of Best Printer Co. Ltd., Vancouver, is offered to a student in the field of animal science who has a special interest in the care and treatment of domestic animals. The award will be made to a student who has good academic standing and needs financial assistance.

Beta Kappa Chapter of Alpha Delta Pi Sorority Bursary—A bursary of \$50, the gift of the Beta Kappa Chapter of Alpha Delta Pi Sorority, will be awarded to a woman undergraduate who has good academic standing and is deserving of financial assistance.

The Brissenden Bursary—A bursary of \$350, the gift of P. R. Brissenden, Esq., Q.C., is offered in alternate years. It will be awarded to a student in any year and faculty whose standing is satisfactory and who could not continue his studies at the University without financial assistance. The next award will be made in August, 1967.

The British Columbia Corrections Association Bursary—This bursary of \$50, the gift of the British Columbia Corrections Association, is available to a deserving student, studying in the field of the social sciences and preparing for the field of corrections. The award will be made to a student who is in need of financial assistance and has good scholastic standing.

British Columbia Forest Products Limited Bursaries—Bursaries to a total of \$5500, each with a maximum value of \$300, are offered by British Columbia Forest Products Limited to sons and daughters of employees who, by June 30th of the year in which the award is made, have or will have served with the Company for at least one year and whose earnings are limited (see Company brochure for details). They are open to students beginning or continuing studies in the fall in a full undergraduate programme of studies at the University of British Columbia, the University of Victoria, or Simon Fraser University. Awards will be made at the discretion of the University of B.C. to students selected on the basis of their academic standing and need for financial assistance. No award will normally be made, however, to a candidate who obtains an overall average of less than 60% or who is required to write supplementals to obtain clear standing in a full year's work. Winners of the Company's Entrance Scholarships will not be permitted to receive a Company Bursary in the same year. All candidates must apply on the University Bursary form, which may be obtained from the Dean of Inter-Faculty and Student Affairs, University of B.C. This application must be received by the University of B.C. not later than July 15 and must contain the necessary details of family service with the Company.

The British Columbia Institute of Agrologists Bursary—A bursary of \$250 is offered by the Institute of Agrologists to a student entering the degree course in Agriculture for the first time. This bursary will be awarded to an applicant who has a record of good scholastic standing and has need of financial assistance. In choosing the recipient, consideration will be given to farm background and participation in community activities. Winners of this bursary will be selected by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries, after consultation with the Bursary Committee of the Institute of Agrologists and the Dean of the Faculty of Agriculture. Candidates must have their applications approved by a resident agrologist in the district where the application is made. Applications, on forms available from the Dean of Inter-Faculty and Student Affairs, must be received by the University not later than August 1st. The application form should contain an outline of the applicant's record in community activities and an indication of his background in farming.

The British Columbia Loggers' Association Bursary in Forestry—A bursary of \$300, given by the British Columbia Loggers' Association, will be awarded to a student registered in Fourth Year Forestry or Forest Engineering. To be eligible for the award a student must have been a resident in British Columbia for the previous two years, must have a scholastic average of at least 65 per cent in the work of the Second and Third Years at the University of British Columbia, and must give evidence of leadership, sterling character, and physical vigour. He must also have been engaged during at least two summer sessions, or the equivalent thereof, in woods employment, logging operations, cruising, or logging engineering.

The British Columbia Medical Association Bursary Fund—This fund, established and maintained by annual contributions of \$1000 from the British Columbia Medical Association, provides financial assistance for undergraduate students in the Faculty of Medicine. Those who are assisted are asked to accept a moral obligation to reimburse the Fund when they are able to do so.

The British Columbia Surgical Society Bursary Fund—Through annual contributions of \$300 the British Columbia Surgical Society has established

a fund to assist promising and deserving students in the Faculty of Medicine. Students receiving assistance are asked to assume a moral obligation to reimburse the Fund on completion of their training.

The Buell, Ellis, Sargent & Russell Bursary—A bursary of \$150, gift of Buell, Ellis, Sargent & Russell, Barristers and Solicitors, Vancouver, B.C., is offered annually to students beginning or continuing studies in Law. It will be awarded to a student with a good academic record who needs financial assistance.

Bull, Housser & Tupper Bursary—A bursary of \$300, gift of Bull, Housser & Tupper, Barristers and Solicitors, Vancouver, B.C., is offered annually to students beginning or continuing studies in Law. It will be awarded to a student with a good academic record who needs financial assistance.

The Canadian Anaesthetists' Society, British Columbia Division, Bursary—Two bursaries of \$100 each, the gift of the British Columbia Division of the Canadian Anaesthetists' Society and given to honour the memory of Dr. Angus Alexander MacMillan, are offered to students in the Faculty of Medicine. They will be awarded by the University to worthy and deserving students who have good records, show promise, and need assistance. Those who are assisted, although not required to undertake a legal obligation, are asked to assume a moral responsibility to reimburse the fund after completion of their studies, if circumstances permit.

The Canadian Bechtel Limited Bursary—A bursary or bursaries to the total of \$600 are offered annually by Canadian Bechtel Limited to undergraduates in engineering or to matriculants entering engineering. The awards will be made by the University on the basis of financial need and scholastic standing.

The Canadian Cancer Society, British Columbia Division, Bursary—This bursary of \$500, the gift of the Canadian Cancer Society, British Columbia Division, will be available for a student in the Faculty of Medicine who is worthy and deserving of financial assistance. To be eligible for this award an applicant must be a graduate of a high school in British Columbia. Those students who are assisted, although not required to undertake a legal obligation, are asked to assume a moral responsibility to reimburse the fund after completion of their medical studies.

The Canadian Officers' Training Corps (C.O.T.C.) Bursaries—Bursaries to the total of \$300, each ranging in value from \$75 to \$150, are available to members of the Corps continuing their training in the fall with the C.O.T.C. on the campus. These awards are provided to give a measure of encouragement to students deserving of assistance who have good standing, not only in their academic studies but also in the Corps programme. In selecting winners consideration will therefore be given to financial need, academic standing, and record of achievement in the C.O.T.C. Selection will be made by the University, in consultation with the Commanding Officer. Applications, on forms available from the Dean of Inter-Faculty and Student Affairs, must be submitted to the University not later than August 1.

The Canadian Scottish Chapter, I.O.D.E., Bursary in Education—A bursary of \$100, the gift of the Canadian Scottish Chapter, I.O.D.E., will be awarded to a woman student in the Second Year of Education. This bursary will be given to a student who needs financial assistance to begin her studies. In considering applicants, attention will be paid to academic standing, personal qualities, character, and aptitude for teaching.

The Captain G. G. Brown Memorial Bursary—This bursary of \$250, established as a memorial to his wife's father, Captain G. G. Brown, by Mr. T. M. Dauphinee, is offered in any year and faculty. It will be awarded in 1965 and alternate years to a student with a good academic record who, without financial assistance, would be unable to begin or continue his studies. It is the hope of the donor and the University that, if and when circumstances permit, those assisted will themselves help others, as their means may allow.

The Captain LeRoy Memorial Bursary—This bursary of the annual value of \$225, was given by the Universities Service Club in memory of their comrades who fell in the First Great War. It is named after Captain O. E. LeRoy, who commanded the overseas contingent from this University and who was killed at Passchendaele in 1917. It will be awarded to a student, or students, requiring financial assistance to enable him, or them, to attend the University. For this purpose it may be awarded to a matriculant, to a student of any year, or to a graduate student of the University proceeding to graduate work in this or any approved university. In making the award preference will be given first to returned soldiers, then to the dependents of soldiers, and finally to suitable candidates from the student body at large. Applications must contain a statement of the academic record and special circumstances of the applicant, with two supporting references, and, in the case of the preferred categories, of the war record of the soldier.

The Cariboo Bar Association Bursary (in memory of P. E. Wilson, Q.C.)—A bursary of \$250, offered in memory of P. E. Wilson, Q.C., is given annually by the Cariboo Bar Association. It will be awarded by the University to a student in any year of Law who has good academic standing and needs financial assistance. Preference will be given to a student from the area of the Province served by the Cariboo Bar Association.

The Catholic Women's League of Canada, Vancouver Diocese, Bursary—This bursary of \$50, gift of the Catholic Women's League of Canada, Vancouver Diocese, is offered as a tribute to the women who have voluntarily served at the Catholic Library and Information Centre. It will be awarded to a woman student in the School of Librarianship who needs assistance.

The Charles Chan Kent Golden Wedding Scholarship and Charitable Foundation Bursaries—Two bursaries of \$150, the gift of the Charles Chan Kent Golden Wedding Scholarship and Charitable Foundation, are offered to students who are proceeding to a degree in any field, have successfully completed at least one year at the University of B.C., and need financial assistance. They will be awarded to students of Chinese extraction. If possible, one award will be reserved for a Chinese student from overseas.

The Chartered Life Underwriters' Bursary—A bursary of \$200, the gift of the Vancouver-Westminster Chapter of the Institute of Chartered Life Underwriters of Canada, will be offered in 1966-67 to students who are proceeding to the Third Year of Commerce and who are including life insurance in their programme of studies. The award will be made to a student whose academic standing, character, and need for financial assistance are, in the opinion of the Faculty of Commerce and Business Administration, judged to be meritorious.

Chilliwack University Women's Club Bursary—As on page 149.

The Chilliwack Rotary Club Bursary Fund—This fund, established and maintained by the Chilliwack Rotary Club through annual donations of \$300, provides assistance in the form of bursaries, for worthy and deserving

students in the Chilliwack area who are proceeding to studies at the University of British Columbia. Selection of the winners will be made by a committee of the Club, in consultation with the principals of the local high schools, and the University. In order to provide assistance for as many as possible in the future, those who receive awards will be asked to assume a moral obligation to reimburse the fund when they have graduated.

The Clark, Wilson & Co. Bursary—A bursary of \$200, gift of Clark, Wilson, & Company, Barristers and Solicitors, Vancouver, B.C., is offered annually to students beginning or continuing studies in Law. It will be awarded to a student with a good academic record who needs financial assistance.

The Comitas Club Bursary—A bursary of \$200, gift of the Comitas Club of Vancouver, whose object is to help cerebral-palsied children, will be offered to students in training as physiotherapists in the School of Rehabilitation Medicine. The award will be made to a student with promise in this field who is worthy and deserving of financial assistance.

The Coronation Chapter (1902-1960) Imperial Order Daughters of the Empire Memorial Bursary—To commemorate its services and achievements for nearly sixty years, the Coronation Chapter Imperial Order Daughters of the Empire, on relinquishing its Charter in February, 1960, presented an endowment fund to the University. The income from this endowment annually provides a bursary in perpetuity, at present \$140, which is to be used to assist worthy and deserving women students beginning or continuing studies at the University in any field of study. In the selection of recipients, consideration will be given to the need for financial assistance, academic standing, and promise of service to the Commonwealth and Empire, with special preference for descendants of veterans.

The Cowichan Valley Medical Society Bursary—A bursary of \$300, the gift of the Cowichan Valley Medical Society, is offered annually to a student from the Cowichan Valley area who is taking pre-medical or medical studies at the University of British Columbia. The award will be made to a student who has good academic standing and needs financial assistance. If, in any year, no applicant qualifies, the funds contributed will be available either to provide a larger award or several awards in a future year.

The David Fouks Memorial Bursary—A bursary of \$1000, established as a memorial to David Fouks by his brother, Arthur Fouks, Esq., Q.C., B.A., LL.B., is offered annually to undergraduates in any year and faculty. The award will be made by the University to a student of good academic standing who shows promise of success in his chosen field of studies and who is deserving of financial assistance.

The David Thom Bursaries—From the funds of the David Thom Estate a sum of \$300 is available annually for the following bursaries:

1. A sum of \$100 for the student who has passed Grade XII or Grade XIII with the highest standing and who is registered for the first time in the Faculty of Agriculture. In the awarding of this bursary, regulation 8 under General Regulations for Medals, Scholarships, Prizes, and Bursaries does not apply.
2. A sum of \$100 for a student who has satisfactorily completed the work of the First Year in Agriculture and is proceeding to a higher year in that Faculty.
3. A sum of \$100 for a student who has satisfactorily completed the work of the Third Year in Agriculture and is proceeding to the Fourth Year in that Faculty.

The Davis & Company Bursary—A bursary of \$400, the gift of the law firm of Davis, Hossie, Campbell, Brazier & McLorg, Vancouver, B.C., is offered annually to students in the First or Second Year in the Faculty of Law. At the discretion of the Bursary Committee it may be divided to provide assistance in the amount of \$200 each for two students. These bursaries will be awarded to students with good academic standing and promise who need financial assistance to continue their studies.

Delta Gamma Bursary For the Blind—A bursary of \$100, given by the Delta Gamma Fraternity, will be awarded to a blind student requiring financial assistance to enable him or her to enter the University or to proceed to further studies. The award will be made by the Senate upon recommendation of the Joint Faculty Committee on Prizes, Scholarships, and Bursaries acting in consultation with the Principal of the Jericho Hill School and/or secondary school concerned, the Superintendent of the Canadian National Institute for the Blind of Vancouver, and an accredited representative of Delta Gamma Fraternity.

Delta Zeta Chapter of Alpha Gamma Delta Fraternity Bursary—A bursary of \$50, the gift of the Delta Zeta Chapter of Alpha Gamma Delta Fraternity, is available annually for a woman undergraduate student in any year and faculty. The award will be made to a student on the basis of scholastic standing and need of financial aid.

The Department of Social Welfare, Province of British Columbia, Bursaries in Social Work—Two bursaries of \$1000 each, established by the Department of Social Welfare, Province of British Columbia, are offered annually to graduates of the University of British Columbia or University of Victoria proceeding to the First Year of Social Work at the University of British Columbia. The awards will be based on scholastic standing, personal qualities and display of special interest in public affairs. Consideration will also be given to the financial circumstances of applicants. The successful applicants must be prepared to enter the employ of the Department of Social Welfare for a period of at least sixteen months following completion of the first year of study in the School of Social Work. Applicants should consult the Director of the School about their admission to Social Work and the procedure for applying for these bursaries. They will be awarded by a special joint committee composed of representatives of the Department and the School.

The Doctor Joseph Vickar Memorial Bursary—A bursary of \$100, established as a memorial to Dr. Joseph Vickar by his friends, and given through the Vancouver B'nai B'rith Hillel Foundation, is offered to pre-dental and pre-medical students in attendance at this University. In making the award consideration will be given to need and academic standing.

The Donald Buckland Memorial Bursary Fund for the Blind—In memory of Donald Channing Buckland (1917-1956), a graduate of this University and a distinguished member of its Faculty, and in tribute to his scholarship, unflinching devotion to duty, and especially to his courage when, a few years before his untimely death, he was himself overtaken by blindness, the Canadian National Institute for the Blind has established a fund to assist and encourage blind students. This fund will be administered by a special committee representing the Institute and the University, and will be used to assist students proceeding to studies beyond the level of secondary school. Awards will be made only to those who show evidence of ability and promise.

The Donald S. McPhee Forestry Awards—A bequest from the late Donald S. McPhee has established the Donald S. McPhee Forestry Scholarship Fund. Under the terms of the bequest, the yearly income is to be used to provide prizes, scholarships and bursaries in the fields of forestry and forest engineering for worthy and deserving students who are in attendance at this University and are selected by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries.

The Dorothea Lundell Bursary for Students of French—This bursary of \$150, in memory of Dorothea Lundell (B.A., UBC, 1932 and Teacher Training, 1933), was established through a bequest from her mother, Kirsten Cedarholm Lundell. It will be awarded to a worthy and deserving student who is majoring or honouring in French language or literature.

The Douglas F. Johnston Bursaries—A bequest from the late Douglas F. Johnston provides bursaries annually of \$500 each. One of these bursaries will be awarded to a student entering the Final Year of Engineering and another to a student entering the Final Year of Agriculture. When possible the bursary in Agriculture will be awarded to a student specializing, or intending to specialize, in stock raising.

The Douglas, Symes & Brissenden Bursary in Law—A bursary of \$300, gift of the firm of Douglas, Symes & Brissenden, Vancouver, is offered annually in the Faculty of Law. It will be awarded to a student who has good academic standing, shows promise of success in legal studies, and needs financial assistance.

The Dr. Ernest Billig Memorial Bursary—This bursary, established as a memorial to Dr. Ernest Billig by his wife, is offered to students proceeding to a degree in Medicine or in Education. It will be awarded annually, in the amount of \$150, to a student who needs financial assistance, has good academic standing, and shows promise of success in his or her chosen field.

The Dr. Rolf S. Manson Memorial Bursary—A bursary of \$500, established and endowed as a memorial to Dr. Rolf Stuart Manson by Mrs. Manson and her son, Rolf S. Manson Jr., is offered annually to a worthy and deserving student in the Faculty of Medicine. Augmented by contributions from friends and colleagues, it serves to pay tribute to his professional skill and to his generous and devoted public service. It is the hope of the donors that those who benefit from this fund will themselves, if and when circumstances permit, contribute to this or similar funds to give assistance to other students.

Dr. William Campbell Memorial Bursary—The Class of Medicine 1954 (University of British Columbia) decided on the occasion of its tenth anniversary reunion to establish a bursary as a memorial to Dr. William Campbell. The annual bursary of approximately \$100 will be awarded to a student who is entering his Third Year of Medicine, has satisfactory scholastic standing, and needs financial assistance.

The Edith Cavell Hospital Bursary—A bursary of \$50, the gift of the Edith Cavell Hospital Ltd., Vancouver, is offered to a worthy and deserving student beginning or continuing studies in the Faculty of Medicine. Preference will be given to a student with financial need who has a special interest or excels in studies concerning diseases peculiar to the ageing process.

The Education Undergraduate Society Council Bursaries—Two bursaries of \$100 each, provided by the Education Undergraduate Society Council are offered to students in Education in the 1966-67 session. These will be awarded,

one in the Secondary Programme and the other in the Elementary Programme, on the basis of need and student activity on the recommendation of the Dean, the Director of Secondary and Elementary Education, and the President of the Education Undergraduate Society, following release of the results of the sessional examinations.

The Edward J. Meilicke Fund—A bequest to the Vancouver Foundation by the late Edward J. Meilicke provides an annual bursary of approximately \$240 for the University. This bursary will be awarded to a student or students taking studies leading to a Bachelor of Science degree.

The E. Frances Gunning Memorial Bursary—This bursary of \$100 is offered annually as a memorial to Mrs. H. C. Gunning. It pays tribute to her gift for lasting friendships and to her sympathetic and active concern for others, including the students of this University. It will be awarded to a student in engineering or nursing who has comparable qualities, good academic standing and financial need.

The Elizabeth and Diana McManus Memorial Scholarship Fund Bursary—A bursary of approximately \$300, provided by a bequest from the late William McManus, will be awarded to the son, daughter or legal dependent of a member of Branch No. 48, Royal Canadian Legion, or failing a suitable candidate, to a student or students in any year and faculty. The recipient must have good academic standing and be in need of financial assistance.

The Elizabeth Dobeson Bursary—The sum of \$200, given by the Bastion Chapter of the Imperial Order Daughters of the Empire, will be available to provide a bursary or bursaries for students from Nanaimo or surrounding districts, beginning or continuing studies at the University. Preference will be given to veterans or dependents of veterans. These bursaries, which are open to students in any year and faculty, will be awarded on the basis of ability and need of financial assistance.

The Ellen Ethel McHattie Memorial Bursary Fund—A bequest to the Vancouver Foundation by the late C. T. McHattie provides an annual bursary of approximately \$300 for the University. This bursary will be awarded through the University to a graduate student registered in the Social Work Course, or to an undergraduate in the Second or higher years in Arts and Science planning to enter Social Work. To be eligible an applicant must have financial need and high scholastic standing.

The Elsie Johnson Bursary—As a memorial to Mrs. Elsie Johnson, Chapter AD of the P.E.O. Sisterhood offers annually a bursary of \$100. This bursary will be awarded to a woman student beginning or continuing her studies in the Second Year in the Faculty of Education. In selecting the winner consideration will be given, not only to the need of applicants for financial assistance, but also to their academic standing and their promise of success in the teaching field.

The Engineers' Wives' Association Bursary—Bursaries provided by generous donations from the Engineers' Wives' Association will be awarded to undergraduate students in engineering who have good scholastic standing and who, without financial assistance, will be unable to continue their course.

The E. S. H. Winn Memorial Bursary in Dentistry—To honour the memory of E. S. H. Winn Esq., Q.C., to pay tribute to his fine personal qualities, and to give recognition to the lifelong encouragement and assistance which he gave to students, this bursary has been established by Dr. Ronald Wad-

dell, Dr. Herbert Guenther, and Dr. Gary Hall. In the amount of \$300 annually, it will be awarded to a student who has completed the pre-dental requirements at the University of British Columbia and is proceeding to an approved School or Faculty of Dentistry. The award will be made to a student worthy and deserving of financial aid.

The Esmond Lando Bursary—A bursary of \$100, the gift of Mr. Esmond Lando, will be available annually to a student in Law. The award will be made to a student with a good academic record who shows promise in his field of studies, and who, without financial assistance, would be unable to continue with his studies.

The Faculty Women's Club Bursaries—Two bursaries of \$125 each, given by the Faculty Women's Club of the University of British Columbia, will be awarded to women students who have completed the first two years of university work and are proceeding to the next year of their course. The students to whom the awards are made must have scholastic ability and need of financial assistance.

The Florence E. Heighway Medical Bursary Fund—This fund, endowed by a bequest from the late Florence E. Heighway, and named to honour her memory, provides bursaries for students taking medical training at this University.

The Florence M. Butchart Fund—The annual income of \$750, derived from the Florence M. Butchart Fund, established by a bequest from William Broadfoot Butchart, provides financial assistance for worthy students attending the University.

The Flying Officer Reverend George Robert Pringle Memorial Bursary—A bursary of the annual value of \$330, endowed by his friends and associates, in memory of the late Flying Officer Reverend George Robert Pringle, a much beloved graduate of outstanding Christian character and athletic ability who was killed on January 24th, 1943, while on active service overseas, will be awarded to a student who has completed two years at this University and has registered at the University for further study. To be eligible for this award the student must show evidence of academic ability, sterling, unselfish character, and active participation and leadership in University sport.

The Fort Camp Bursary Fund—To provide assistance for needy students, the residents of Fort Camp, University of British Columbia, at a general meeting held in November, 1951, initiated a fund at the University by contributing 25 per cent. of their current year's net canteen profits. The annual donation will be used to provide bursaries for students in attendance during the winter session. Preference will be given to a resident of Fort Camp.

The Frances Milburn PEO Bursaries—Two bursaries of \$200 each, given by the Vancouver Chapters of the PEO Sisterhood in memory of the late Frances Milburn, will be available in the winter session to assist women undergraduates who have completed at least one year in Arts and Science with high standing in English. The awards will be made in consultation with the Dean of Women.

The Frank Cox Memorial Bursaries—Four bursaries of \$200 each, established as a memorial to Mr. Frank Cox, Manager, Nelson's Laundries, Vancouver, B.C., by colleagues and friends, and supplemented by Mr. A. B. Christopher, were offered to students proceeding to University studies in September, 1965. These awards were made to students who had good scholastic

standing and need of financial assistance. Preference was given to sons and daughters of employees of Nelson's Laundries and to those proceeding from high school to the First Year of their programme.

The Fraser Valley Bar Association Bursary—Through the generosity of the Fraser Valley Bar Association a bursary of \$300 is awarded annually in the Faculty of Law. Students with good scholastic standing, who have completed at least one year in Law, and who need financial assistance to continue their studies, are eligible for consideration.

The Fraser Valley Milk Producers' Association Entrance Bursary for Agriculture—A bursary of \$300, gift of the Fraser Valley Milk Producers' Association, is available annually to students who are entering the Faculty of Agriculture for the first time and who have graduated from any high school in the Province of British Columbia. The award will be made to a deserving and promising student. Applicants will be considered on the basis of qualities of character and leadership as indicated by their interest in, and contribution to, school and community affairs.

The Fraser Valley Milk Producers' Association Bursary in Dairy Technology—A bursary of \$500, the gift of the Fraser Valley Milk Producers' Association, is offered annually to a student entering Third Year Agriculture and specializing in dairy technology. The award will be made to a student who has a special interest in a career in the dairy industry. In addition to the bursary, the winner may be given, between the Third and Fourth Years, the opportunity of summer employment in some phase of the Association's operations. Should no Third Year applicant be considered suitable, the bursary may be offered to a student entering the Fourth Year.

The Fred D. Mulholland Bursary in Forest Management—An annual bursary of \$75, established by Mrs. F. D. Mulholland and family as a memorial to an outstanding leader in forestry in British Columbia, is offered to students in forestry. This bursary will be awarded to a student completing the Third Year who has good academic standing in specified courses in the field of Forest Management, and needs financial assistance.

The Freeman, Freeman, Silvers & Koffman Bursary in Law—This bursary of \$100, the gift of Messrs. Freeman, Freeman, Silvers & Koffman, is available annually for a student registered in the Faculty of Law. It will be awarded to a student who has good scholastic standing and is worthy and deserving of financial assistance.

The Fresco Club Bursary—A bursary of at least \$50, donated by The Fresco Club of Vancouver as part of its welfare programme, will be offered to undergraduates in the session 1966-67. This bursary will be awarded to a promising student deserving of financial assistance.

Gamma Phi Beta Bursary—A bursary of \$100, the gift of the Vancouver Alumnae Chapter of Gamma Phi Beta Sorority, will be awarded annually to a student in any year of the Home Economics course. To be eligible for this award a student must have financial need and high scholastic standing.

The George Rush Bursaries—From the income on a bequest from the late George Rush, two or more bursaries of equal value will be awarded annually to students of scholastic ability who are registered in any year of any faculty and who need financial assistance to continue their studies.

The Gordon Young (B.C.) Limited Bursary in Poultry Science—A bursary of \$350, the gift of Gordon Young (B.C.) Limited, is offered annually to

undergraduate and graduate students in Poultry Science. It will be awarded to a student who has good academic standing and needs financial assistance to continue his studies. At the discretion of the Chairman of the Division of Poultry Science the bursary may be shared in equal amounts by two students.

The Graduating Class of 1959 Bursary—A bursary of approximately \$180, established and endowed by the Graduating Classes of 1959, is offered annually to undergraduates in any year and faculty. It will be awarded to a student with good academic standing who requires financial assistance to begin or continue his or her University studies.

The Graduating Class of 1965 Bursary—A bursary of approximately \$200, established and endowed by the Graduating Class of 1965, is offered to undergraduates in any year and faculty. It will be awarded to a student with good academic standing who requires financial assistance to begin or continue his or her university studies.

The Grand Lodge Masonic Bursaries—The Grand Lodge of Antient Free and Accepted Masons of British Columbia annually offers bursaries in the range of \$200 to \$500 each with preference to the sons, daughters, and legal wards of active members of Masonic Lodges in British Columbia or of deceased members who at the time of death were active members of these Lodges. The purpose of these bursaries is to give assistance to students who, without financial aid, would find it impossible or difficult to continue their education. Selection of winners will be made by the University from applicants with satisfactory academic standing who are beginning or continuing undergraduate studies at the University of British Columbia, Simon Fraser University, University of Victoria, or the B.C. Institute of Technology in a full programme leading to a degree or certificate in any field. First preference will be given to applicants entering the University or College from Grades XII and XIII, then to undergraduates who were assisted in a previous year, and finally, to others. In order to be considered a candidate must obtain from the office of the Dean of Inter-Faculty Affairs, University of B.C., Vancouver 8, B.C., a Bursary Application form. The completed application must be received by the University not later than July 15th. If the applicant is the son, daughter, or legal ward of a member of the Lodge the application must be accompanied by a letter giving the name and address and details of the lodge with which the applicant's immediate family is or has been associated. Since a special committee considered applicants for these bursaries, those who also wish to apply for other bursaries should submit a separate application form for them.

The Gulf and Fraser Fishermen's Credit Union Bursary—This bursary of \$350 is offered by the Gulf and Fraser Fishermen's Credit Union to students beginning or continuing studies at the University of B.C. in a full programme of studies leading to an undergraduate degree in any field. To be eligible an applicant must be an active member of the Credit Union, or a son or daughter of an active member of the Credit Union. It will be awarded by the University, in consultation with the Credit Union, to the applicant who, in terms of financial need and academic standing, is the most deserving of assistance. Candidates must apply by completing the University Bursary Form. This form, which may be obtained from the Dean of Inter-Faculty and Student Affairs, University of B.C., Vancouver 8, B.C., must be submitted to the University not later than July 15th.

The Hawk Eilertson Bursaries—Two or more bursaries of \$500 each are provided each year from the Hawk Eilertson Bursary Fund. These bursaries

will be awarded to students beginning or continuing their studies leading to a degree in engineering, forestry, or agriculture. They are available to students from underdeveloped countries in the British Commonwealth who are selected on the basis of academic standing and promise of success in university studies, need for financial assistance, and personal qualities and character.

The Helen Gordon Stewart Bursary—A bursary of \$100, the gift of the Fraser Valley Regional Library, is offered annually to a student beginning studies in the School of Librarianship. The award will be made to a student with good academic standing who shows promise in the field of librarianship and needs financial assistance. In offering this bursary, the Fraser Valley Regional Library pays tribute to Dr. Helen Gordon Stewart for her manifold leadership in the development of British Columbia Libraries and particularly for her pioneering efforts in the establishment of regional library service in the Fraser Valley. Application forms may be obtained from the Dean of Inter-Faculty Affairs, University of British Columbia.

Helliwell, Maclachlan & Co. Bursary—A bursary of \$200, a gift of Helliwell, Maclachlan & Co., Chartered Accountants, is available annually to a student or students registered in the combined programme for C.A. and degree of B.Com. The award will be made to a student or students who have good scholastic standing and are worthy and deserving of financial assistance.

H.M.C.S. Discovery Chapter, I.O.D.E. Bursary—A bursary of \$100, gift of H.M.C.S. Discovery Chapter, I.O.D.E., is offered to a student (man or woman) who has completed two years of university study. The award will be made to a student who has served in the navy or whose parent or parents have so served.

The IBM-Thomas J. Watson Memorial Bursary Programme—Bursaries to the total of \$1000, provided annually by a gift from International Business Machines Company Limited, Don Mills (Toronto), Canada, are offered to needy undergraduates in any year of any faculty who are of good academic standing. The awards will be made by the University. Students should apply on the University Special Bursary form. The completed applications must be received not later than August 1st.

The Institute of Chartered Accountants of British Columbia Bursary—A bursary of \$250, given by the Institute of Chartered Accountants of British Columbia in memory of the late William George Rowe, F.C.A., will be awarded at the discretion of the Dean of Commerce and Business Administration to a student registered in the Second Year of the accounting option and proceeding to the Third Year. Selection of the winner will be made on the basis of scholastic standing and record.

Interior B.C. Dental Association Bursary—A bursary of \$250, gift of the Interior B.C. Dental Association, is offered to students in the Faculty of Dentistry. It will be awarded by the University to a student with a good academic record who needs financial assistance. Preference will be given to a student from the Interior.

The International Union Local 300 Bursary—A bursary of \$250, the gift of the International Union of United Brewers, Flour, Cereal, Soft Drink and Distillery Workers of America, Local 300, is offered to students entering the University from high school. It is open to applicants who reside in the lower mainland area and are proceeding in any faculty to a full course of study

leading to a degree in any field, with preference to sons and daughters of Local 300. It will be awarded on the basis of need for financial assistance and of academic aptitude.

The Jack Aron Memorial Bursary—A bursary of \$50, given by Mrs. Jack Aron as a memorial to her husband, is offered to undergraduates in the Faculty of Medicine. It will be awarded to a student with a good academic record who shows promise in the field of Medicine and has need of financial assistance.

The Jennie Wolochow Memorial Bursary—A bursary of \$25, the gift of Dr. Michael Wolochow, in memory of his mother, is offered to a worthy and deserving student who is beginning or continuing studies at the University in any field of study leading to a degree.

The Jessie F. Gordon Chapter, I.O.D.E., Bursary in Education—A bursary of \$75, a gift of the Jessie F. Gordon Chapter, I.O.D.E., will be awarded to a student preferably from Senior Matriculation who is beginning studies in Second Year Education. The award will be made to a student with good academic standing and promise as a teacher, and who needs financial assistance.

The John MacRae Memorial Bursary—A bursary of \$250 will be awarded annually from the proceeds of an endowment made by Mrs. John MacRae to commemorate the ideals of her husband, who was among the early practitioners of pharmacy in this community. The award will be made to a student of good academic standing in the Faculty of Pharmacy who is in need of financial assistance and whose qualities of character indicate that he will regard his profession as a means of public service. It is the donor's hope that the recipient, without obligation, will in due course assist others in a similar manner.

The Jonathan Rogers Awards—The annual income from a fund bequeathed by the late Jonathan Rogers will be used to provide awards for undergraduates who require financial assistance and who have high scholastic standing. Selection of the recipients will be made by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries.

The J. Roddy Pegg Memorial Bursary—A bursary of \$50, established as a memorial to the late James Rodney Pegg by his family and many friends, will be available annually to a student in Commerce. The award will be made to a student with satisfactory academic record who shows sufficient interest in student activities and athletics and who, without financial assistance, would be unable to continue his studies.

Kappa Kappa Gamma Alumnae Bursary No. 1—A bursary of \$150, provided annually from the proceeds of an endowment fund donated by the Alumnae of Kappa Kappa Gamma, is offered annually to a woman undergraduate in any year and faculty who has good scholastic standing and has need of financial assistance. The award will be made by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries, in consultation with the Dean of Women.

The Kenneth George VanSacker Bursary—This bursary, in the amount of \$100, was established by his wife as a memorial to Kenneth George VanSacker, who graduated from the University of B.C. in 1957 with the degree of B.A.Sc. in Electrical Engineering. It will be awarded to an undergraduate with good

academic standing who is proceeding to a degree in this field and who has need for financial assistance.

The Kerrisdale Chapter, I.O.D.E. Bursary—This bursary of \$100, the gift of the Kerrisdale Chapter, I.O.D.E., will be awarded to a student who has good scholastic standing and is in need of financial assistance.

The Ketchum Manufacturing Sales Limited, Bursary—A bursary of \$50, gift of the Ketchum Manufacturing Sales Limited, Ottawa, will be available in the winter session for a student in the field of animal husbandry. The award will be made to a worthy student who has satisfactory academic standing.

The Khaki University and Young Men's Christian Association Memorial Fund Bursaries—A sum of money given to the University by the administrators of the Khaki University of Canada provides a fund from which are awarded annually six bursaries of the value of \$100 each, known as the Khaki University and Young Men's Christian Association Memorial Bursaries. Under conditions specified by the donors these bursaries may be used for undergraduate purposes only, and in making the awards a preference is given to the sons and daughters of soldiers of the First Great War. The financial necessities of candidates are also taken into account. To be eligible for an award a soldier's dependent must obtain at least Second Class standing, i.e., 65 per cent.; for all others 75 per cent. is required. Dependents of soldiers and others who have attained the standing as stated above and who are in need of financial assistance should apply not later than August 1st.

The Kiwanis Club of Vancouver, B.C. Bursary for Soil Conservation—A bursary of \$200, the gift of the Kiwanis Club of Vancouver, B.C., will be awarded in the session 1966-67 to a Second Year student in the field of Soil Conservation. The award will be made to a student with good academic standing who is worthy and deserving of financial aid.

The Kiwanis Club of Vancouver, B.C. Bursary for Wild Life Conservation—A bursary of \$200, the gift of the Kiwanis Club of Vancouver, B.C., will be awarded in the session 1966-67 to a Second Year student in the field of Wild Life Conservation. The award will be made to a student with good academic standing who is worthy and deserving of financial aid.

The Ladies Pharmaceutical Auxiliary Bursaries in Pharmacy—Three bursaries of \$100 each, the gift of the Ladies Pharmaceutical Auxiliary, Lower Mainland, are available annually in the Faculty of Pharmacy. They will be awarded to three students with good academic records who, without financial assistance, would be unable to begin or continue their studies in the Faculty of Pharmacy.

The Ladies Pharmaceutical Auxiliary (Victoria) Bursaries—Two bursaries of \$100 each, gift of the Ladies Pharmaceutical Auxiliary (Victoria), are offered annually to Vancouver Island students beginning or continuing studies in the Faculty of Pharmacy.

The Lady Laurier Club Bursary—A bursary of \$75, given by the Lady Laurier Club of Vancouver, will be awarded to a woman undergraduate who has completed at least two years of her undergraduate studies and is proceeding to her degree. The award will be made on the basis of scholastic standing.

The Lady Laurier Club War Memorial Bursary—As a special award the Lady Laurier Club provides a bursary for women students who have good scholastic standing. The award, in the amount of approximately \$75, will be made in consultation with the Club.

The Lady May Cambridge Chapter, I.O.D.E. Bursary in Teacher Training—A bursary of \$100, the gift of the Lady May Cambridge Chapter, I.O.D.E., will be offered to students in the Final Year of the teacher training course in the session 1966-67. The award is open to daughters of veterans.

The Lambda Kappa Sigma Alumni Bursary—A bursary of \$100, donated by the Alpha Lambda Chapter of Lambda Kappa Sigma Sorority, will be available in the 1966-67 session to assist a female Pharmacy student, with preference given to a member of the sorority who is continuing her studies in the Faculty of Pharmacy.

The Lawrence, Shaw, Stewart & McLoughlin Bursary—A bursary of \$300, gift of Lawrence, Shaw, Stewart & McLoughlin, Barristers and Solicitors, Vancouver, B.C., is offered in the Faculty of Law. It will be awarded annually to a student of promise who needs financial assistance.

The Lieut.-Col. Cecil Merritt, V.C., Chapter, I.O.D.E., Bursary—This bursary of \$70, the gift of Lieut.-Col. Cecil Merritt, V.C., Chapter, I.O.D.E., is offered to students who have completed at least one year in Agriculture. Preference will be given to a student from a rural area. It will be awarded to a student who needs and merits financial assistance.

The Lighthall Memorial Bursary—A bursary of \$50, given by Sigma Phi Delta Fraternity in memory of Professor A. Lighthall, a member of the Department of Civil Engineering of this University from 1920 to 1945, will be available annually for a male undergraduate in any year of the Faculty of Applied Science. The award will be made to a student who has good scholastic standing and who, without financial assistance, would be unable to continue his course.

The Lions' Ladies Club Bursaries—A bursary of \$200, the gift of the Lions' Ladies Club of Vancouver, will be available for native born B.C. Indian students, pursuing studies in any year and field. The award will be made through the Joint Faculty Committee on Prizes, Scholarships, and Bursaries.

The Louis Toban Bursary No. 1—A bursary of \$100, the gift of Louis Toban, is available annually for a student entering the Second Year of the course in Pharmacy. The award will be made on the recommendation of the Dean of the Faculty to a student who has shown definite ability and has need of financial assistance.

The Louis Toban Bursary No. 2—A bursary of \$100, the gift of Louis Toban, is available annually for a student entering the Third Year of the course in Pharmacy. The award will be made on the recommendation of the Dean of the Faculty to a student who has shown definite ability and has need of financial assistance.

The Lower Mainland Pharmacists' Association Bursaries—Two bursaries of \$100 each, the gift of the Lower Mainland Pharmacists' Association, are offered to students in the Faculty of Pharmacy. They will be awarded, on the recommendation of the Faculty, to worthy and deserving students in need of financial assistance. Preference will be given to a student proceeding to the Second Year.

Lower Mall Residences Association Bursary—A bursary of \$150, the gift of the Lower Mall Residences Association, is offered annually to students in any year and faculty who have good scholastic standing and need financial assistance. Preference will be given to those residing in the Residences on the Lower Mall.

The Manly Cohen Memorial Bursary—As a memorial to Manly Cohen (B.Com., U.B.C., 1953), this bursary has been established by his friends. An annual award of \$50 will be made to a worthy and deserving student in the Faculty of Commerce and Business Administration.

The Margaret Highmoor Dryden Bursary—In memory of his sister, Margaret Highmoor Dryden, who contributed greatly to the community life of British Columbia through her work with the Save the Children Fund, the Navy League of Canada, the Women's Canadian Club, and other organizations, this bursary in the amount of \$25 is offered annually by Claude Kendall Highmoor, 57 Anglesey Boulevard, Islington, Ontario. It will be awarded to a woman student, worthy and deserving of assistance, who is beginning her studies at the University or is taking work in a field related to the welfare of children.

Maud LeGallais Memorial Bursary—To honour the memory of Maud LeGallais and her contributions in the field of education as founder and head of St. Michael's School for Girls, Vernon, this bursary has been established by former students and friends. It will be awarded annually to a woman student who has completed high school in Vernon, B.C., and is beginning her studies at the University of B.C. The award will be made to a student worthy and deserving of financial aid.

The Max Freeman Bursary—This bursary of \$25, the gift of Mr. Max Freeman of Vancouver, will be awarded to an undergraduate who is financially deserving and has good scholastic standing.

The M. B. Cohen Memorial Bursary—This bursary of the annual value of \$25, the gift of Mrs. M. B. Cohen of Vancouver, will be awarded to an undergraduate in any year or faculty who has good scholastic standing and is in need of financial assistance.

The Mildred Brock Memorial Bursary—The Mildred Brock Fund, established by Delta Gamma Fraternity in memory of Mrs. Mildred Brock, wife of the late R. W. Brock, Dean of Applied Science, serves to pay tribute to her personal charm, high ideals, sympathetic understanding and qualities which were an inspiration to all students, particularly to members of Delta Gamma Women's Fraternity. In the amount of \$125, it will be available to a woman student of high scholastic standing.

The M. M. Waterman Bursary—This bursary of the annual value of \$25, the gift of Mr. M. M. Waterman of Vancouver, will be awarded to an undergraduate in any year or faculty who has good scholastic standing and is in need of financial assistance.

The M. M. Waterman Grandchildren Bursary—A bursary of \$60, gift of the grandchildren of Mr. M. M. Waterman, is offered to students in any year and faculty who have good academic standing and need financial assistance.

The Moe Cohen Bursary—This bursary of the annual value of \$50, the gift of Mr. and Mrs. Moe Cohen of Vancouver, will be awarded to an undergraduate in any year or faculty who has good scholastic standing and is in need of financial assistance.

The Moses Fouks Bursary—This bursary, in the amount of approximately \$150, established by a bequest from the late Moses Fouks, is offered to students in any year and faculty. It will be awarded to a student who has a good academic standing and needs financial assistance.

Mount Baker High School, Cranbrook, Bursary—A bursary of \$250, gift of an anonymous donor, is offered annually to students from Mount Baker Senior High School in Cranbrook who have satisfactory academic standing and are beginning their studies at this university.

Mt. Garibaldi Chapter, I.O.D.E. Bursary—A bursary of \$100, the gift of the Mt. Garibaldi Chapter, I.O.D.E., is offered to students in the final year of Social Work. The award will be made to a student with good academic standing who shows promise in the field of Social Work and has financial need. In the event that there is no suitable candidate in this field the award will be made to a student in the final year of Nursing with similar qualifications.

The Mr. and Mrs. Louis Zack Memorial Bursary—In memory of Mr. and Mrs. Louis Zack, this bursary of \$200 has been established by their son and daughter-in-law, Mr. and Mrs. Sidney Zack. The award will be made to a student in the field of political science who has need for financial assistance and is specializing in the field of political science.

The Mr. and Mrs. Meyer Waldman Bursary—This bursary of \$50 was donated by the family of Mr. M. M. Waterman and by Dr. and Mrs. S. B. Gelfand in honour of Mr. and Mrs. Meyer Waldman on the occasion of their Fiftieth Wedding Anniversary. It will be awarded to a student in any year and faculty who needs financial assistance and has a good academic record.

The Mr. and Mrs. M. Fouks Bursary—In memory of Mr. and Mrs. M. Fouks, this bursary of \$200 has been established by their daughter and son-in-law, Mr. and Mrs. Sidney Zack. It will be awarded to a student in the Faculty of Education who has need for financial assistance, has good academic standing, and shows promise of success for a career in teaching.

The Mr. and Mrs. Myer Wine Bursary—A bursary of \$50, the gift of Mr. and Mrs. Myer Wine, is offered to undergraduates in any year of any faculty. It will be awarded to a student who has good academic standing and needs financial assistance.

The Mr. and Mrs. Sidney Zack Bursary—A bursary of \$100, gift of Mr. and Mrs. Sidney Zack, is offered annually in the School of Librarianship. It will be awarded to a student who has a good academic record, shows promise in the field of library science, and needs financial assistance.

The Nat Bell Bursary—A bursary of \$150, given by Angela Bell in memory of her father, will be awarded annually to a student registered in any year and any faculty who has ability, character, and financial need.

The New Westminster Rotary Club Bursary—A bursary of \$250, the gift of the Rotary Club of New Westminster, is available for an undergraduate who has graduated from a high school in the territorial limits of the Club, and who is taking a full course of study in any year and faculty at the University. To be eligible for consideration applicants must have high scholastic standing and need of financial assistance. The territorial limits of the Club include the following high schools: Lester Pearson, Como Lake, North Surrey, Princess Margaret, and Queen Elizabeth. The winner of this bursary will be selected by the Joint Faculty Committee of the University.

The Norris-Mebius Bursary Fund—This fund, the gift of Mrs. Ann Norris Niemen, honours the memory of her mother, Mary Norris and her father, Joshua Norris (a resident of Nanaimo for over fifty years),

and pays tribute to their indomitable courage and sterling qualities of character. It is also a memorial to her teacher, Lucy Mebius, who taught in Nanaimo for many years at Quennel School, and who, through her generosity and personal interest, encouraged and inspired her students. The annual income provides bursaries for male graduates of British Columbia secondary schools who are residing in the Province. These bursaries will be awarded to needy students with good academic records who are registered at the University in studies leading to careers in medicine, law, creative writing, forestry, engineering, and secondary teaching.

The North Shore Medical Society Bursary—This bursary of \$300, the gift of the North Shore Medical Society, is available for a student in the Faculty of Medicine who has good academic standing and needs financial assistance to proceed with his course. It will be awarded to a student whose permanent residence is and has been for some time in the City or District of North Vancouver, or the District of West Vancouver.

The Oscar Soderman Memorial Bursary Fund—The annual income from this fund, a bequest of the late Daisy Sidney Soderman, will be used to provide bursaries, scholarships, or other assistance, for worthy and deserving students beginning or continuing studies in Forestry and allied fields or Forest Engineering. If no suitable candidates are eligible in these fields the income will be used at the discretion of the Board of Governors on recommendation from the Scholarship Committee.

The Oswyn John Boulton Bursaries—These bursaries, to a total of approximately \$500 annually, are provided from a capital bequest made by the late Margaret Jane Boulton. They will be awarded to students in the Faculty of Law on the basis of academic standing and financial need.

Pacific Meat Company Bursary—A bursary of \$200 is offered annually by Pacific Meat Company of Vancouver for research related to problems of the meat industry. The award is open to a student, or students, in the field of animal husbandry.

The Panhellenic Association and the Inter-Fraternity Council Bursary Fund—The annual income of \$50 from this fund, established in January, 1950, by the Panhellenic Association and the Inter-Fraternity Council, representing the sororities and fraternities on the campus, is used to provide a bursary for an undergraduate in need of financial assistance. The award is available for a student in any year and faculty.

The P.E.O. Sisterhood, Chapter A.M., Memorial Bursary—A bursary of \$100, the gift of the P.E.O. Sisterhood, Chapter A.M., will be awarded to a woman student in the Faculty of Education who is proceeding to a certificate or a degree in the teaching field. The award will normally be made to a student in the First Year but if she maintains satisfactory standing she will be given consideration for a renewal in successive years of her course. In selecting the winner consideration will be given to financial need, academic standing and promise in the field of teaching.

The P.E.O. Sisterhood, Chapter B, Bursary—A bursary of \$100, the gift of Chapter B of the P.E.O. Sisterhood, is available to a woman student from the New Westminster area who is beginning or continuing her studies at the University in a full course leading to a degree. The award will be made to a student who not only has good standing and shows promise but who also needs financial assistance.

The P.E.O. Sisterhood, Chapter F., Bursary—A bursary of \$50, gift of Chapter F., P.E.O. Sisterhood, is offered annually to a student in any year of the degree

course in Nursing or in the Social Work course. It will be awarded to a woman student who has good academic standing and needs financial assistance.

The Pharmaceutical Association of the Province of British Columbia Entrance Bursary—A bursary of \$100, the gift of the Pharmaceutical Association of the Province of British Columbia, will be available annually to a student entering the First Year of the Pharmacy course, who has good scholastic standing and is in need of financial assistance.

The Plimsoll Club Bursary (donated by the Canadian Stevedoring Company Limited)—This bursary, in the amount of \$300, is available for a student registered in any year and faculty. It will be awarded to a deserving student who has satisfactory standing but who, without financial assistance, would be unable to begin or continue his studies at the University.

The Plimsoll Club Bursary for Law (donated by the Anglo-Canadian Shipping Company Limited)—This bursary of \$300 is available for students registered in any year of the Law course. It will be awarded to a student or students who, by their records, show promise of success in Law, and who not only would be unable to continue their courses without financial assistance, but are also worthy and deserving of it.

The Plimsoll Club Bursary in Medicine (donated by the Empire Stevedoring Company Limited)—This bursary of \$300 is available for award in the Faculty of Medicine at the University of British Columbia. It will be awarded to a worthy and promising woman student who is registered in the Faculty of Medicine and is continuing in studies leading to the degree of M.D.

The Poultry Industries Fund—This fund, established by the Trustees of the Poultry Blood Testing Fund, provides an annual bursary, ranging from \$100 to \$150, depending upon the financial circumstances of the recipient. It will be awarded, on the recommendation of the Chairman of the Division of Poultry Science, to a student, graduate or undergraduate, who has a good academic record, shows promise in the field of poultry science, and needs financial assistance.

The Princess Betty Chapter, I.O.D.E., Bursary—A bursary of \$150, given by the Princess Betty Chapter, I.O.D.E., will be available for a woman undergraduate entering the University of British Columbia from Grade XII. This award will be made to a student who has at least Second Class standing, and who, without financial assistance, would be unable to begin her studies at the University.

The Procter & Gamble Student Bursary Fund—A bursary fund of \$1,500 annually for the University has been set up by the Procter & Gamble Company of Canada Limited, to benefit needy students in any faculty or year who are of good academic standing. Recipients must expect to maintain permanent residence in Canada, but there are no other restrictions. It is hoped by the Company and the University that any student who benefits from the Fund will later contribute to the general bursary funds of the University when in a position to do so. These bursaries may be held concurrently with other awards. Applications, on the University Bursary Form, must be filed at the University before July 15th.

The Provincial Council of British Columbia, Canadian Daughters' League Bursaries—Two bursaries of \$100 each, the gift of the Provincial Council of British Columbia, Canadian Daughters' League, will be available annually to assist women students who could not otherwise continue their courses.

The awards, which will be made on the basis of character, academic record, and scholastic ability, will be open to graduates entering the Teacher Training Course. In the event that no applicant in this course can qualify, the awards will be open to students entering Social Work.

The Quan Memorial Bursary Fund—This fund, established as a memorial to Mrs. Quan Gow and Mrs. Jean Quan Yee by their family and friends, provides a bursary annually of \$100. This bursary will be awarded to a student with First Class standing entering the Third or Fourth Year.

The Queen Elizabeth II Coronation Bursary—This bursary of \$100, the gift of the Provincial Chapter of British Columbia, I.O.D.E., will be available in the winter session. The donation will be used for a student who has good scholastic standing and is deserving of financial assistance. The award will be made after consultation with the Provincial Educational Secretary and the Provincial President, I.O.D.E.

The R.A.F. Silver Jubilee Chapter, I.O.D.E., Bursary—A bursary of \$100, the gift of the R.A.F. Silver Jubilee Chapter, Imperial Order Daughters of the Empire, is offered in the Faculty of Medicine. It will be awarded to a promising and deserving male student in the Fourth Year who has high standing and needs financial assistance.

The R.C.A.F. Chapter, I.O.D.E., Bursary in Medicine—A bursary of \$150, gift of the R.C.A.F. Chapter, I.O.D.E., will be awarded in the winter session to a student in the First Year of the Faculty of Medicine. The award will be made to a student who, without financial assistance, would have been unable to continue in the course.

The R.C.A.F. Veterans' Bursary Fund—A sum of money given to the University by the Wartime Convalescent Home, War Charity Funds, Incorporated, Vancouver Division, provides an annual fund of approximately \$550 for bursaries. These bursaries will be available for R.C.A.F. Veterans of the War 1939-45 and for their dependents. Awards will be made on the basis of scholastic standing and financial need.

The Retail Wholesale & Department Store Union Local 535 Bursary—This bursary of \$250 is offered by the Retail Wholesale & Department Store Union Local 535 to sons, daughters, and legal wards of active members of the Union in good standing. It is open in competition to applicants who are proceeding from Grade XII or Grade XIII to begin studies at the University of British Columbia, the University of Victoria, or Simon Fraser University, in a full programme leading to a degree in any field. To be eligible for consideration a candidate must have satisfactory academic standing (normally an overall average of at least 65% in Grade XII or XIII). In the selection of the winner, the basic factor will be the financial need of the candidates and their families. Those who wish to apply for this bursary must obtain the University Bursary Form from Dean Walter H. Gage, University of B.C., Vancouver 8, B.C. The completed application must be received by him not later than July 15th. The winner will be selected in consultation with the Union.

The Robert D. Sheret Memorial Bursary—To honour the memory of Robert D. Sheret, and to pay tribute to the respect and affection in which he was held by those with whom he was personally and professionally associated, his friends, colleagues, and members of the dental profession have established a fund. From this fund a bursary of \$100 will be awarded annually to a student in dentistry who has good academic standing and needs financial assistance.

The Robert Donald Mitchell Memorial Bursary—This bursary has been established by Mr. and Mrs. R. F. Mitchell of Rossland in memory of their son, Robert Donald, who attended this University in the sessions 1961-62-63. In the amount of \$300, it will be awarded to a student with good personal qualities and academic record, and who is worthy of and in need of financial assistance. The bursary is open to students who have completed two years of study in the Faculty of Science in a full programme leading to a degree.

The Robert S. Day and Son Limited Bursary (donated through the Vancouver Men's Canadian Club)—A bursary of \$150, the gift of Robert S. Day and Son Limited, will be available annually for a student who has completed the Third Year of Commerce with high standing, and is proceeding to the Final Year. The award will be made only to a student who has need of financial assistance.

The Rotary Club of Vancouver Memorial Bursaries—To commemorate the sacrifices and services of Rotarians and their families in the conflicts of this century, the Rotary Club of Vancouver offers annually to students at the University eight bursaries of the value of \$300 each. These bursaries are open to students in any year and in any faculty. To be eligible for the awards, applicants are required to be of good moral character and to have a reasonable interest in extra-curricular activities and a good record of scholastic attainment. Awards will be made only to those who have limited financial ability and who are beginning or continuing their University studies.

Royal Emblem, I.O.D.E., Bursary in Education—A bursary of \$100, the gift of the Royal Emblem, I.O.D.E., is offered to a student who has completed Grade XIII or First Year University and who is proceeding toward a degree or certificate in teaching. The awards will be made only to those who have need of financial assistance.

The Ruskin Chapter, I.O.D.E., Alfred Newton Wolverton Memorial Bursary—A bursary of \$300, established by the Ruskin Chapter of the I.O.D.E. through a bequest from Alfred Newton Wolverton, is offered annually to worthy and deserving undergraduates in Mining Engineering. In making the award preference will be given, first to students entering the Third Year, and second, to those proceeding from the Third to the Final Year. Awards will be made on the basis of scholastic ability, promise in the field of mining, and financial need.

The Sam Bass Bursary—In honour of Sam Bass, and to commemorate in 1965 his birthday on April 25, this bursary was established and endowed through the gift to the University of \$1000 by his wife and children. The income provides an annual bursary for a worthy and deserving student in the Faculty of Medicine who has a good record in pharmacology.

The Sea Going Hacks Bursary—A bursary of \$200, given by the Sea Going Hacks, an association of drug travellers, will be awarded to a student in Pharmacy who is recommended to a Committee of the Association by the University Joint Faculty Committee on Prizes, Scholarships and Bursaries in consultation with the Dean of the Faculty of Pharmacy. The award will be made on the basis of scholarship and need.

Sir John Franklin P.T.A. Bursary—A bursary of \$50, the gift of Sir John Franklin P.T.A., is offered to a worthy and deserving student entering the University. Under the terms of the award the student selected must have attended Sir John Franklin School in Grades V and VI.

The Slavonic Studies Bursary—A bursary of \$250, the gift of Walter C. Koerner, in honour of Dr. William J. Rose, will be offered annually to a student specializing in any field of Polish, Russian or Slavonic Studies. The award will be made to a student who has need of financial assistance and who has attained high standing.

South Vancouver B.C. Branch 16 of the Royal Canadian Legion Bursaries—Two bursaries of \$125 each are offered to students in the Second Year from David Thompson or John Oliver High School, Vancouver. Preference will be given to sons and daughters of veterans. The awards will be made on the basis of academic standing and need.

The Sperry Phillips Memorial Bursary—A bursary of the annual value of \$190, endowed by friends and associates of the late Sperry S. Phillips (B.S.A., U.B.C., 1923), who prior to his untimely death by accident in 1945, contributed much to the development of Junior Farmer Activities in British Columbia, will be awarded to a student entering the Faculty of Agriculture or the School of Home Economics for the first time. In making the award, consideration will be given to academic ability and Junior Farmer Club membership.

The St. Paul's Hospital Medical Staff Bursary—An annual bursary in the sum of \$300 will be granted by St. Paul's Hospital Medical Staff to a student in the Faculty of Medicine, University of British Columbia, who has shown satisfactory scholastic attainment and is deserving.

The Steel Company of Canada Limited Bursaries—Nineteen bursaries, each of \$500 a year, until graduation, but for a maximum of four years, are offered annually by the Steel Company of Canada, Limited to selected students attending certain universities across Canada. They are provided to give aid to capable students in any field of study who are permanent residents of Canada and who, without financial assistance, might otherwise not be able to attend. Selections of the winners are made by the Universities concerned. One of these awards will be made by the University of British Columbia. In order to qualify for renewal each year, the holder of an award must maintain standards of achievement satisfactory to the University. Each bursary is accompanied by a grant-in-aid of \$500 per annum to the general funds of the University.

The Stry Credit Union Bursary—A bursary of \$400 is offered by Stry Credit Union to students who are members of the Stry Credit Union, for six months prior to July 1st of the year of application, and who are the sons, daughters, or legal dependents of members of at least one year's standing. It is open in competition to students proceeding from Grade XII or Grade XIII to attendance at the University (or University of Victoria or Simon Fraser University) in a full course leading to a degree. The winner will receive \$300 during the first year of studies and, subject to satisfactory standing, \$100 during the second year. The award will be made on the basis of financial need and academic standing. If no suitable candidates apply in any year, the award will not be made in that year, but will accrue for the purpose of making additional awards in a future year, when more than one suitable candidate has applied.

The Summerland Kiwanis Club Bursary—A bursary of \$150, the gift of the Kiwanis Club of Summerland, is available annually for a student from Summerland who is beginning or continuing studies at this University. The award will be made in consultation with the Club to a student who has academic promise and is in need of financial assistance.

Surrey Co-operative Association Bursary—This bursary of \$300, given by Surrey Co-operative Association, will be awarded to a student entering the Faculty of Agriculture for the first time from the trading area of the Surrey Co-operative Association. This bursary will be awarded to an applicant who has a record of good scholastic standing. Consideration will be given to his or her agricultural background and participation in community activities. Winners of this bursary will be selected by the Joint Faculty Committee on Prizes, Scholarships and Bursaries. Applications, on forms available from the Dean of Administrative and Inter-Faculty Affairs, must be received before July 15th.

The Thomas Holmes Johnson Bursaries—Through a bequest from the late Thomas Holmes Johnson, the following bursaries have been provided.

(1) A bursary of approximately \$350 to be awarded annually to the son or daughter of a member in good standing of Tyee Lodge No. 66, A.F.A.M., beginning or continuing studies in Vancouver at the University of B.C. The selected student must be recommended for this award by the Officers of the Lodge; approved by a favourable vote of 50% of the members of the Lodge at a regular meeting; have attended high school in Prince Rupert, B.C.; and be recommended as to proficiency, good character, and need for financial assistance by the Principal of the High School. The recommendation must reach the Chairman of the University Scholarship Committee by July 15th. Final decision rests with the University Senate. If in any year, no candidate qualifies, the number of awards described in the next section will be increased to three.

(2) Two bursaries of approximately \$350 each will be awarded to students who, having attended high school in Prince Rupert, B.C., are beginning or continuing their studies in Vancouver at the University of B.C.; are recommended as to character and proficiency by the Principal of the High School and three residents of Prince Rupert holding a degree from a Canadian University; and by the Principal as to need for financial assistance. Preference will be given to students whose parents have resided in Prince Rupert for five or more years. Recommendations must reach the Chairman of the University Scholarship Committee by July 15th. Final decision rests with the University Senate.

The Thomas T. and Eva B. Dauphinee Memorial Bursary—This bursary of \$250, established as a memorial to his parents, Thomas T. and Eva B. Dauphinee, by Mr. T. M. Dauphinee, is offered in any year and faculty. It will be awarded in 1966 and alternate years to a student with a good academic record who, without financial assistance, would be unable to begin or continue his studies. It is the hope of the donor and the University that, if and when circumstances permit, those assisted will themselves help others, as their means may allow.

The Tobias Tellefsen Bursary in Philosophy—This bursary in the amount of approximately \$250 has been endowed and established to honour the memory of Tobias Tellefsen by the Western Star Lodge No. 10, Independent Order of Oddfellows. It serves to mark his 52 years as Secretary of the Lodge and to indicate the high regard of his fellow members for his fine personal qualities and deep devotion to his duties. This bursary will be awarded to a student who has completed at least one year at the University, who has good academic standing and needs financial assistance, and who is specializing in philosophy at the University of British Columbia. Other factors being equal, preference will be given to the son or daughter of a member of an Oddfellows Lodge in British Columbia.

The U.B.C. Scholarship and Bursary Fund—The income from this Fund, established by the Vancouver Foundation, and initiated by a bequest from the late Archibald P. Glen, provides awards to assist deserving students at the University of British Columbia, Vancouver.

University Women's Club Bursary—A bursary of \$300, given by the University Women's Club of Vancouver, will be available for a woman student of high scholastic standing in the Third Year of the Faculty of Arts and Science who is proceeding to the Fourth Year.

University Women's Club General Bursary—A bursary of \$300, given by the University Women's Club of Vancouver, will be available for a woman student registered in any year and any faculty. To be eligible for this award a student must have high scholastic standing and need of financial assistance.

The Unknown Warrior Chapter, I.O.D.E., Bursary in Public Health Nursing—A bursary of \$100, the gift of the Unknown Warrior Chapter, I.O.D.E., will be awarded to a woman student entering the Final Year of Public Health Nursing. The award will be granted to a student who has high scholastic standing and is in need of financial assistance.

The Upper Vancouver Island Medical Society Bursary—A bursary of \$250, the gift of the Upper Vancouver Island Medical Society, is offered annually to a First Year student in the Faculty of Medicine. The award will be made to a promising student who needs financial assistance to begin his or her medical studies. Preference will be given to a student from Upper Vancouver Island.

The Valcartier Camp Chapter, I.O.D.E., Bursary—A bursary of \$100, given by the Valcartier Camp Chapter, I.O.D.E., will be awarded annually to a woman student who has good academic standing and is in need of financial assistance. This bursary is available to a student proceeding to the First Year in Arts.

The Vancouver Bar Association Bursaries—Three bursaries of \$200 each, the gift of the Vancouver Bar Association, will be awarded in the session 1966-67 to students in the Faculty of Law. One bursary will be available for a student entering each of the three years of the course in Law. Awards will be based on scholastic standing and financial need.

The Vancouver Business and Professional Women's Club Bursaries—Two bursaries of \$100 each, the gift of the Vancouver Business and Professional Women's Club, are offered to women students proceeding to a degree in any field. The awards will be made to students with good academic standing who need financial assistance to continue their studies at the University.

The Vancouver City Hall Employees Society Bursary—This bursary of \$200, established by the Vancouver City Hall Employees' Society, is open annually to members of the Society and to sons, daughters and legal dependents of members, who, at the time the award is made, have held membership in the Society for at least two years. It will be awarded by the University, in consultation with the Society, to a qualified member who is beginning or continuing studies at the University in a full programme leading to a degree. The basis of award will be financial need, and academic standing in previous studies. Candidates must apply on the University Bursary form, obtainable from the Dean of Inter-Faculty and Student Affairs. It must reach the University by July 15th.

Vancouver Civic Employees Union Bursary—A bursary of \$150, the gift of the Vancouver Civic Employees Union, is offered annually to (1) members

of the Union; (2) sons, daughters or wards of members or deceased members; (3) sons and daughters of any trade union member. The award will be made to an applicant, on the basis of financial need and competence in studies, pursuing work in any year and faculty. If no applicants are available in the above categories the University may award the bursary to any other deserving student.

Vancouver Fire Fighters' Union Local No. 18 Bursary—A bursary of \$200, gift of the Vancouver Fire Fighters' Union Local No. 18, provides a bursary for a student beginning or continuing studies at the University. The award will be made to a physically handicapped student who needs financial assistance and is worthy and deserving of support.

Vancouver Alumnae Panhellenic Bursary—A bursary of \$200, given by the Vancouver Alumnae Panhellenic Association, will be awarded to a woman student of satisfactory academic standing, who has completed at least the first two years of University work. The award will be made on the recommendation of the Dean of Women.

The Vancouver Section National Council of Jewish Women Adult Education Bursary—A bursary of \$100, the gift of the Vancouver Section of the National Council of Jewish Women of Canada, is offered to students at the graduate level pursuing studies in the field of Adult Education. It will be awarded to a student who proposes on completion of studies to seek employment where the training enables him or her to give service to the community in the area of adult education. In selecting the winner consideration will be given to financial need, previous academic record, prior experience in community service, and to interest and promise in the field of adult education.

The Vancouver Section National Council of Jewish Women Bursary—A bursary of \$100, the gift of the Vancouver Section of the National Council of Jewish Women of Canada, will be awarded to a woman student who is a graduate registered in the Teacher Training Course. To be eligible for this award a student must have good ability and financial need.

The Vancouver Section National Council of Jewish Women Bursary for Social Work—A bursary of \$200, the gift of the Vancouver Section of the National Council of Jewish Women of Canada, will be awarded to a student in the field of Social Work. It is open to those who are beginning or continuing studies toward the degree of B.S.W. or M.S.W. at this University and propose to specialize in group work. In accordance with the principles of this gift, the bursary will be awarded to a student who not only shows promise in the field of Social Work, but also has need of financial assistance.

The Vancouver Section National Council of Jewish Women Bursary for Social Work—A bursary of \$150, the gift of the Vancouver Section of the National Council of Jewish Women of Canada, is offered to students continuing a programme of studies leading to a degree in Social Work. It will be awarded to a student who has need of financial assistance, shows promise of success in the field of Social Work, and has a strong interest in community service.

The Vancouver Transportation Club Bursary—A bursary of \$200, the gift of the Vancouver Transportation Club, is offered to a graduate or undergraduate student in the transportation option of the Faculty of Commerce. The award will be made on the basis of financial need in the Fall term.

Vancouver Women's Transportation Club Bursary—A bursary of \$100, gift of the Vancouver Women's Transportation Club is offered to a student

in the Faculty of Commerce and Business Administration. It will be awarded to give financial assistance to a student who has a genuine interest in the study of traffic and transportation related to Commerce.

The Victoria Home Economics and Dietetic Association Bursary—This bursary of \$150, the gift of the Victoria Home Economics and Dietetic Association, will be awarded annually to a woman student whose home is in Victoria or some other centre on Vancouver Island, and who is entering the Second, Third, or Fourth Year in Home Economics at this University. The award will be made on the basis of financial need to a student of good academic standing.

The Vinten Fund Bursary—A bursary of approximately \$250, provided by a gift from Mrs. H. B. Norris through the establishment of the Vinten Fund in the Vancouver Foundation, is offered annually to a worthy and deserving student proceeding to courses in Engineering. The award will be made by the Vancouver Foundation on the recommendation of the Joint Faculty Committee on Prizes, Scholarships and Bursaries of the University.

The War Amputations of Canada, Vancouver Branch, Bursaries—Twenty bursaries of \$200 each, provided by the War Amputations Association of Canada, Vancouver Branch, are offered to children and grandchildren of active members of the Branch. These bursaries are available to selected students who are taking a full-time course of study past the Grade XII level at a recognized institution of learning. Applicants must have a clear academic record in a full programme of studies in the year most recently completed. Only two War Amputation Bursaries may be granted to any one student. Applicants attending the University of B.C. must apply by July 15 on the University Bursary form, which may be obtained from the Dean of Inter-Faculty Affairs.

War Memorial Bursary—This bursary of approximately \$100, provided by the income on a fund established by graduates and friends of the University through donations from G. E. Baynes, Esq., P. R. Brissenden, Esq., Q.C., Hotel Grosvenor, Alfred W. McLeod Limited, and Seely & Company Limited, will be awarded annually to a worthy and financially deserving undergraduate in any year and faculty. In making this award, preference will be given first to veterans or members of the Merchant Navy, who served in World War II, then to sons and daughters of those who served, and finally to students generally.

The W. D. Shaffer Bursary Fund—This fund was bequeathed by the late Marion Alice Shaffer, B.A., B.Com., a graduate of this University, who served with distinction as a teacher in the Schools of British Columbia and won the affection of all for her generosity and courage. It was the expressed wish of the donor that the income from the fund be used, as a memorial to her brother, to provide assistance for worthy and deserving students, preferably those proceeding to a career of teaching in the public schools of British Columbia.

Weldwood of Canada Limited Bursaries—Bursaries to the total of \$500, the gift of Weldwood of Canada Limited, are offered to Forestry or Forest Engineering students entering the Third or Fourth Year who, in addition to having good scholastic standing, have demonstrated a genuine interest in human relations by their extra-curricular activities or their training in the humanities at the University, or both. Candidates will be selected by a committee which will judge their special qualifications. Other considerations equal, the student in circumstances of greater need will be given preference.

The West Kootenay Medical Association Bursary—A bursary of \$250 from the West Kootenay Medical Association, is offered to students registered in the Faculty of Medicine and taking a full course leading to the degree of M.D. It will be awarded to a promising and deserving student who requires financial assistance. First preference will be given to students from the West Kootenay area of the Province. The recipient is asked to assume a moral obligation to reimburse the fund when he has completed his training.

West Kootenay Rod and Gun Club Association Bursary—This bursary, the gift of the West Kootenay Rod and Gun Club, is offered to students who completed high school in British Columbia, with preference to those from the West Kootenay area. It will be awarded annually, on the basis of merit and need, to a Third or Fourth Year student in the field of Wildlife Management or Fisheries Management. In 1966-67 the amount of the bursary will be \$100.

Westminster Medical Association Bursary—This bursary of \$500, the gift of the Westminster Medical Association, will be awarded to a student in the Faculty of Medicine for study in the winter session. The award will be made to a promising student of good ability who, without financial assistance, would be unable to begin or continue his studies in the Faculty of Medicine. The winner is asked to assume a moral obligation to reimburse the fund when he has completed his training.

White Spot Restaurants Limited Bursaries—Two bursaries, having a total value of \$1000 each, are provided by White Spot Restaurants Limited for their employees, and sons and daughters of their employees, who are below the rank of manager and have served with the firm for at least two years. These bursaries are paid in annual amounts of \$250 each and are open in competition to eligible students proceeding from Grade XII or XIII of secondary school to a full programme of studies at the University of B.C., Simon Fraser University, or the University of Victoria. For purposes of qualification, "employees" shall include students having part time employment with the Company while attending secondary school. The decision as to qualification by employment shall rest with the Company. In all other matters, winners will be selected by the Scholarship Committee of the University of B.C. on the basis of academic standing and need for financial assistance. To be considered a candidate must (a) write the standard departmental examinations conducted in June by the Department of Education, B.C. and obtain an overall average of at least 65% in these examinations; (b) submit the special bursary form to the University of B.C. not later than July 15. This form may be obtained after June 1st from the Dean of Inter-Faculty and Student Affairs, University of B.C., Vancouver 8, B.C. Winners will be considered for renewals of these bursaries for their second, third and fourth years of University attendance (up to graduation). Renewals each year, however, are not automatic and will be made only to those who file a new application, pass in all subjects with a minimum overall average of 65%, and have need for financial assistance.

The Willard Kitchen Memorial Bursaries—Three bursaries of \$500 each, given by his daughters, are available for male students in the Faculty of Medicine proceeding to the degree of M.D. These bursaries have been established to assist worthy and deserving male students of academic distinction who, because of their character and ability, give promise of outstanding achievement in the field of medical studies.

William C. Moresby, Q.C., Bursary—A bursary of \$150, the gift of the Victoria Bar Association, will be awarded in the session 1966-67 to a student

in the Faculty of Law. Preference will be given to students coming from the Victoria area. Awards will be based on scholastic standing and financial need.

The W. Jack H. Dicks Bursary—A sum of \$275 will be awarded to a student who has completed at least one year of work in the Faculty of Agriculture, who is proceeding to a higher year in the Faculty, and who has given evidence of possessing those qualities necessary for community leadership.

The Women's Auxiliary to the Canadian Paraplegic Association Bursaries—Two bursaries of \$200 each are offered by the Women's Auxiliary to the Canadian Paraplegic Association, B. C. Division to paraplegic students or sons and daughters of paraplegics. These bursaries are available to students who are beginning or continuing studies in one of the universities in British Columbia. They will be awarded by the University Selection Committee in consultation with the donors. To be eligible, an applicant must have satisfactory academic standing and need financial assistance.

The Worthington Memorial, I.O.D.E., Bursary—A bursary of \$300, the gift of the Worthington Memorial Chapter, I.O.D.E., will be awarded to a member of the B.C. Regiment or the Cadet Corps of the B.C. Regiment who is beginning or continuing his studies at the University. In making the award, consideration will be given not only to the financial need of those who are eligible, but also to their records with the Regiment or the Cadet Corps.

Xi Alpha Chapter of Beta Sigma Phi Sorority Bursary—A bursary of \$50, gift of the Xi Alpha Chapter of Beta Sigma Phi, an international sorority, is available annually for women students who are proceeding to the Second Year in the Faculties of Arts and Science, Education, or Agriculture, First Year Pharmacy, or the First Year in the Faculty of Applied Science. The award will be made to a student who has good scholastic standing and is in need of financial assistance. In choosing the recipient, consideration will be given to character and qualities of citizenship.

The Yates Memorial Scholarship and Bursary Fund—This fund, established by a bequest from Nora Yates as a memorial to her son, Frederick H. L. Yates, provides bursaries and scholarships, known as Yates Memorial Awards. These awards, to a total of approximately \$800, are made annually to promising and deserving students, beginning or continuing studies at this University, who have financial need or high academic standing. First preference is given to veterans of World War II, then to sons and daughters of those who so served, and finally to the student body at large.

For Summer Session

Players' Club Alumni Bursary—A bursary of \$50, given by the Players' Club Alumni, of U.B.C., will be awarded at the discretion of the Head of the Department of Theatre to a promising student of good ability attending the Summer School of the Theatre to obtain credit in at least one 3-unit course.

University Summer Session Bursaries—Thirty bursaries of \$50 each are available in the summer session, for undergraduates who are taking a full course (6 units) of work in the summer session. They will be awarded to students who hold permanent teaching certificates in British Columbia and are actively engaged in teaching in the Province. Awards will be made on the basis of scholarship, financial need, interest in teaching, and participation in the activities of school and the community. Special consideration will be

given to applicants from more remote parts of the Province. Applications, on forms available at the office of the Dean of Inter-Faculty Affairs, must be received not later than May 31st.

LOAN FUNDS

Inquiries relating to the following loan funds, and all applications for loans, should be addressed to the Dean of Inter-Faculty and Student Affairs, Room 207, Buchanan Building, unless the description indicates otherwise.

Applications for loans should be made in advance of the opening of the session. Although loans in limited amounts may also be made during the session, provided funds are available, students should not begin attendance on the assumption that they will be eligible for or receive assistance. In particular, they must meet academic requirements acceptable to the Loan Committee. Students with weak academic records, or those on probation, or who have failed in the previous year of attendance at school or university, or who are on probation, will not be granted loans.

Loans are not normally made to students outside British Columbia until they have attended the University for at least one winter session.

Students are also advised that adult guarantors satisfactory to the Accountant's office are required.

Winter Session Loan Funds

Canada Student Loans—The academic year 1966-67 will be the third year of operations for the Canada Student Loans Plan. This plan was introduced by the Federal Government as a broad programme to assist students who, in the absence of a loan, would be unable to pursue full-time post-secondary studies at a university or other educational institution. Canada Student Loans, available only on the basis of certificates of eligibility issued by the appropriate authority (issuing agency) for a province, may be made by any branch of the chartered banks and by certain designated credit unions with the guarantee of the Federal Government. Applications for certificates of eligibility must be made to provinces participating in the plan, and decisions on individual applications are made by the Provincial appropriate authority (issuing agencies). Students applying for certificates who meet residence and other requirements must also demonstrate that the financial means available to them from all other sources are insufficient so that a guaranteed loan is needed. In no case will a loan for an academic year exceed a maximum of \$1,000 or total loans exceed \$5,000 during a student's academic career. Provincial authorities may issue certificates of eligibility under the plan up to the limits of provincial allocations in each loan year. Borrowers under the plan are required to repay principal and pay interest, but no payments are required as long as they are full-time students at a specified post-secondary educational institution and for six months thereafter; interest during this period is paid by the Federal Government on behalf of the student. After a student's interest-free period has expired, he is required to make regular monthly payments which include repayment of principal and $5\frac{3}{4}$ percent per annum simple interest on the outstanding balance. The number of years over which a loan may be repaid depends on the loan amount and other considerations but may not exceed ten years from graduation. A student should apply for a loan under this plan only for the funds needed to enable him to continue his studies and in doing so he should give responsible consideration to the repayment obligations he is assuming; a student who actually borrowed the maximum of \$5,000 would, for instance, be obligating himself to pay,

after the expiry of his interest-free period, about \$58.00 each month until ten years after he leaves university. A student in need of a Canada Student Loan should, as a first step, obtain an application form and further information from the appropriate authority (issuing agency) of his Province. Students proposing to attend the University of British Columbia should apply to Dean Walter H. Gage, University of B.C., Vancouver 8, B.C.

The Student Aid Loan Fund—By an Act of the Provincial Legislature the University was authorized in 1959 to borrow money for the establishment of this Fund. Loans will be made only to students with satisfactory standing who fulfil (to the satisfaction of the Loan Committee) requirements of being domiciled in British Columbia, and who require financial assistance. Loans bear interest from the date of issue, and are repayable in regular instalments commencing not later than October 1st of the year in which the approved training programme will be completed. For fuller details and application forms, apply to the Dean of Inter-Faculty and Student Affairs, University of British Columbia, Vancouver 8, B.C.

The A. B. Wing Student Aid Bequest and Fund—This fund was established by a bequest from Marjorie Thelma Wing to assist selected students with financial need to begin or continue their studies at the University of British Columbia, Vancouver. Preference is given to students in mechanical engineering or related studies. In providing this bequest the donor expressed the hope that those who benefit from the Fund will, if and when circumstances permit, establish similar funds or contribute to the maintenance and perpetuation of this Fund.

The Alma Mater Loan Fund—This fund was established by the graduating classes of 1937 as a trust to be used for loans to undergraduates who have attained satisfactory academic standing. Loans to any one student are limited to a total of \$100. Loans, which are free of interest until May 31st of the session in which they are issued, become due in one year.

The Caribbean Students' Association Loan Fund—Through contributions from members of the Caribbean Students' Association, a fund has been established to provide assistance in the form of loans to students from the Caribbean Area in attendance at the University.

The Carl J. Culter Student Aid Fund—This is a memorial fund established by the family of Carl J. Culter (1884-1948) to help deserving students. To this fund students with satisfactory academic standing and showing promise of service to their communities may apply for loans to help them in beginning or continuing their studies at the University of British Columbia.

The Carroll Howe Corkum Student Aid Fund—This fund, the gift of Carroll Howe Corkum, provides loans for students taking Teacher Training at this University, the awards being based on academic and personal qualities. In order of preference, they are open to male graduates of King George High School, Vancouver, female graduates of the same school, and members of Phi Gamma Delta Fraternity. If in any year, no candidate is suitably qualified, the awards may be made to students proceeding to a degree in another field or withheld to provide larger awards in the next session.

The Charles J. Thompson Student Aid Fund in Architecture—A fund of \$5000, to assist students in Architecture, was established by the late Charles J. Thompson, Esq., LL.D., A.R.I.B.A., F.R.A.I.C., a member of the firm of Sharp and Thompson which won the open competition for the building project of the University in 1912. Since that time, Mr. Thompson contributed much of professional skill and personal interest to construction and develop-

ment on the campus. The purpose of the fund is to assist promising and needy students proceeding to a degree in Architecture. Loans from the fund, which do not become repayable or bear interest until after the student's graduation, are available for undergraduates registered in the Second or a higher year.

The Christmas Seal Medical Student Loan Fund—From this fund, the gift of the British Columbia Tuberculosis Society, loans are available to deserving medical students in any year of the medical course. Terms of repayment will be recommended by the Committee after a review of the financial circumstances of the applicant.

C.I.M.M., B.C. Section, Loan Fund—A fund established and maintained by the Canadian Institute of Mining and Metallurgy, B.C. Section, provides loans for students at the University of British Columbia who are members of the Dawson Club. Loans from this fund will be made to promising and deserving applicants. Application should be made to the Dean of Inter-Faculty Affairs.

The Class of 1929 Student Assistance Fund—This fund was established by the Class of '29 in commemoration of the observance of its twenty-fifth anniversary. The fund is used to provide loans for worthy and deserving students.

The College of Dental Surgeons of B.C. Loan Fund for Dental Hygiene—Two loans of \$500 each are offered annually by the College of Dental Surgeons of B.C. to women students with at least University Entrance standing who are residents of British Columbia and have been accepted at an approved school or faculty in a course leading to certification in British Columbia as dental hygienists. Selection of the recipient will be made on the basis of academic standing and need for financial assistance. Loans will be interest free until completion of the course, after which they will bear interest at the rate of 5% per annum. Recipients may make arrangements to repay the loans in regular monthly instalments over a two-year period following graduation. The promissory note covering the loan will require the signature of the applicant and of her parent or guardian (or other adult satisfactory to the University). A candidate must apply by letter to the Dean of Inter-Faculty and Student Affairs not later than August 1st. The letter of application must be accompanied by evidence of acceptance by an approved school or faculty and a transcript of the candidate's academic record. The candidate will also be required to complete a University loan application form.

The Col. Herbert Mercer Loan Fund—Loans from this Fund, a bequest from Patricia Edwina de Boinne Bower, are offered to deserving students beginning or continuing attendance at the University of British Columbia.

Columbia Preceptory, No. 34, Knights Templar, Student Aid Fund—From this fund, established by a gift of Columbia Preceptory, No. 34, Knights Templar, Vancouver, assistance is available for members of the student body of the University. The purpose of this fund is to provide a measure of financial aid for students who, by virtue of their personal qualities, academic records, and promise, are worthy and deserving of support. In granting assistance, first preference will be given to those proceeding to a career in theology.

The Cromie-Dix Memorial Fund—This fund was established as a memorial by the friends of Samuel Patrick Cromie and William Derek Dix, who lost their lives in a tragic accident on February 16th, 1957. Samuel Cromie, born in Vancouver in 1918, was at the time of his death, Vice-President and

Assistant Publisher of The Vancouver Sun; and William Dix, born in London, England, in 1918, was Vice-President of Sales for Canada of Neon Products of Canada Limited. Both served in the Second World War and contributed generously of their time and talents to the welfare of their fellow citizens, especially through their work with the Community Chest. In keeping with the tenor of their public service the fund provides assistance to male students in the fields of boys' work, leadership training, education, social work and welfare, social sciences, advertising, journalism, community and regional planning, and related areas of study. Students in these fields needing assistance to begin or continue their university studies may obtain information from the Dean of Inter-Faculty and Student Affairs.

Dal Grauer Graduate Student Aid Fund—This fund, established as a memorial to Dr. A. E. Dal Grauer by Frank McMahon, provides loans for students accepted as candidates for the Ph.D. degree at the University of British Columbia in the fields of Economics, Physics and Engineering, and who are worthy and deserving of aid. In general, loans from this fund are interest free until the student obtains his degree, and terms of repayment will be arranged on an individual basis.

The Dean Clement Student Aid Fund in Agriculture—In honour of Frederick M. Clement, who served as a member of the Faculty of Agriculture from 1916 to 1949 and as Dean from 1919 to 1949, and in recognition of his contributions and achievements, the Agricultural Undergraduate Society has established a loan fund to assist undergraduates in Agriculture who, during the session, require emergency financial assistance. Loans from this fund are subject to the approval of the Dean of Agriculture. Further information may be obtained from the offices of the Dean of Women, the Dean of Agriculture, or the Dean of Inter-Faculty and Student Affairs. It is the hope of the Agricultural Undergraduate Society that those who have been assisted from this fund or those who have benefited from Dean Clement's guidance and instruction in past years will contribute to this undergraduate student effort.

The Dean E. D. MacPhee Commerce Student Aid Fund—In honour of Earle D. MacPhee, who served this University from 1950 to 1963 as Professor, Director, and Dean of Commerce and Business Administration, and as Honorary Bursar and Dean of Administrative and Financial Affairs, this fund was established through the Alumni Annual Giving by contributions from Commerce graduates. It marks the affection and esteem in which Dean MacPhee is held by his former students, and gives recognition to his distinguished services to the University and community. Loans from this fund will be made to graduate and undergraduate students in Commerce.

The Dean E. L. Woods Memorial Loan Fund—In honour of the memory of Esli Longworth Woods, first Dean of the Faculty of Pharmacy at this University, the Pharmacy Alumni have established a loan fund to assist students registered in the Faculty. Loans from this fund will be available for those who are recommended by the Dean of Pharmacy. Application forms are available at the office of the Dean of Inter-Faculty and Student Affairs.

Dr. A. E. H. Bennett Medical Student Aid Fund—This fund, established by a bequest from the late Dr. Allan Edward Hingston Bennett, provides loans for students registered in the Faculty of Medicine. Loans from this fund are interest-free until the completion of medical training and internship. Further information is available from the Dean of Inter-Faculty and Student Affairs.

The Dr. Marianne Jetter Student Aid Fund—This fund, a bequest from Dr. Marianne Rose Jetter, provides assistance, in the form of loans, for deserving students.

The E. M. Kierstead Student Aid Fund—This fund, established in memory of Professor E. M. Kierstead, a beloved professor in Acadia and McMaster Universities, has been made available to provide loans for students requiring limited financial assistance in emergency situations.

The Ernest G. Sherwood Student Aid Fund—This fund, the gift of Ernest G. Sherwood, Richmond, B.C., provides assistance for students in attendance at the University who have satisfactory academic standing and are worthy and deserving of encouragement and support.

The Georgian Club Fiftieth Anniversary Student Aid Fund—This fund, established in 1961 by the Georgian Club of Vancouver to mark the fiftieth Anniversary of its founding, provides assistance to women graduates of the Faculty of Arts and Science who are continuing studies in Librarianship, Social Work, or Teacher Training, or in the Faculty of Graduate Studies toward a higher degree in any field. This fund is administered by the University Committee on Scholarships, Bursaries, and Loans. Loans will be arranged on an individual basis.

The G. T. Cunningham Memorial Loan Fund—As a memorial to the late George T. Cunningham and in tribute to his services to the profession of pharmacy, to his long and continued interest in the University, and to his outstanding contributions in many phases of public life, the Pharmaceutical Association of the Province of British Columbia has established a loan fund. Loans from this fund will be made by the University Committee on Prizes, Scholarships, and Bursaries in consultation with the Dean of Pharmacy.

The Graduating Classes of 1952 Student Aid Fund—This fund was established from a gift made to the University by the Graduating Classes of 1952 for the purpose of assisting deserving undergraduates. Loans for limited amounts are available, without interest, for a period of one year.

The Graduating Classes of 1955 Student Aid Fund—This fund was established as a graduation gift by the Classes of 1955 for the purpose of assisting deserving students. It is administered by the Joint Faculty Committee on Prizes, Scholarships, and Bursaries.

The Graduating Classes of 1956 Student Aid Fund—This fund, established by a gift from the Graduating Classes of 1956, provides loans for deserving students. Further information may be obtained from the Dean of Inter-Faculty and Student Affairs.

The Graduating Classes of 1961 Student Aid Fund—This fund, the gift of the graduating classes of 1961, provides assistance in the form of loans for undergraduates taking a full programme of studies leading to a degree. The terms and conditions of repayment are determined after consultation with the applicant.

The Graduating Classes of 1962 Student Aid Fund—As a gift to the University on the occasion of graduation, the Classes of 1962 established a fund to provide loans for deserving students. It is administered by the Joint Faculty Committee on Prizes, Scholarships, Bursaries and Loans. Conditions of repayment will be decided on the basis of the applicant's circumstances.

The Graduating Classes of 1963 Student Aid Fund—As a gift to the University on the occasion of graduation, the Classes of 1963 established a fund to provide loans for deserving students. It is administered by the

Joint Faculty Committee on Prizes, Scholarships, Bursaries and Loans. Conditions of repayment will be decided on the basis of the applicant's circumstances.

Graduating Class of Agriculture Student Aid Fund—This fund, initiated by the Graduating Class of Agriculture 1962, and augmented by the Class of 1963, provides loans for worthy and deserving students in any year in the Faculty of Agriculture. Loans will be arranged to meet the needs of individual applicants. It is the hope of the Graduating Class of 1962 that individuals and future graduating classes will contribute to this fund as their means may allow.

Home Economics Loan Fund—From a fund established from gifts of anonymous donors, loans are available for undergraduates registered in any year of the Home Economics Course. Loans are also available for graduates in Home Economics taking further work at the University in a related field or in Education. Loans to any one student will not exceed \$200, and are repayable commencing one year after the applicant discontinues attendance at the University, until which time no interest will be charged. Applicants must be recommended by the School of Home Economics.

The H. R. MacMillan Loan Fund—Through the generosity of Dr. H. R. MacMillan, C.B.E., a loan fund has been established to assist students in Forestry. Loans from this fund are to be repaid within three years from graduation, and until then no interest will be charged. Assistance to any one student is limited to \$300. Loans will be made on the basis of scholarship and financial need.

The H. R. MacMillan Special Loan Fund—This fund has been established by Dr. H. R. MacMillan, C.B.E., to provide assistance, in the form of loans, for the sons and daughters of employees of the MacMillan, Bloedel and Powell River Company Limited, the British Columbia Packers Limited, or subsidiaries of these companies. Loans, which are available only for study at this University, are for limited amounts. Applicants must have good scholastic records. They are repayable commencing one year after termination of studies at the University, until which time they do not bear interest. The fund may also be used to provide loans for other students.

The Hugo E. Meilicke Loan Fund—This fund was established and is maintained from the annual income on a gift to the University by Mr. Hugo E. Meilicke through the Vancouver Foundation. It provides loans for students registered for a full programme in the Faculty of Graduate Studies.

The Oswyn John Boulton Student Assistance Fund—This fund, established through a bequest from Margaret Jane Boulton, provides loans for students in Law at this University. Conditions of repayment of loans will be arranged in accordance with the individual circumstances of applicants.

Judge Helen Gregory MacGill Memorial Student Aid Fund—A loan fund initiated by the Phi Delta Delta Legal Sorority has been established in memory of Judge Helen Gregory MacGill who from 1902 to 1947 worked ceaselessly for better laws and conditions for women and children in Canada. Loans from this fund, intended for use in emergency situations to assist women students in the Final Year of the Law course or the degree course in Social Work, are granted on the recommendation of the Joint Faculty Committee on Prizes, Scholarships, and Bursaries, in consultation with the Dean of Women. Assistance to any one student is limited to \$100. Loans are repayable commencing one year from the end of the session and do not bear interest until that time.

The Kiwanis Club of Uptown Vancouver Medical Students' Fund—This fund, established and maintained by the Kiwanis Club of Uptown Vancouver, provides financial assistance for worthy and deserving students who are proceeding to the M.D. degree and have completed the First Year in the Faculty of Medicine.

The Lambda Chi Alpha Fraternity Student Aid Fund—To honour the association of Lambda Chi Alpha Fraternity with the University, this loan fund of \$1000 was contributed by the Auxiliary to the Fraternity. From this fund loans will be made to worthy and deserving students. In each case the terms of repayment will be decided on the basis of the applicant's circumstances.

Law Alumni Student Aid Fund—This fund, established by the Class of Law '48 on the occasion of its tenth anniversary, provides loans for undergraduates in the Faculty of Law.

The Lemuel F. Robertson Memorial Fund in Classics—Professor Lemuel F. Robertson, Classical Gold Medalist at McGill University in 1899, was appointed to the staff of old Vancouver College in 1901. He taught in McGill College of B.C. from 1906 to 1915 and became the first active Head of the Department of Classics of the University of British Columbia in 1915, a position that he held until his retirement in 1941. He was, quite literally, one of the Makers of the University. This fund, established by his family and to which his many friends have been invited to contribute, is intended to assist students, both undergraduate and graduate, who are pursuing Classics as their major field of study.

The Medical Students Loan Fund—This fund, initiated by a donation to the University Development Fund from Mr. W. Clarke Gibson, and increased by contributions from other donors, was established to assist worthy and deserving students in the Faculty of Medicine. Loans will be made in accordance with the individual needs of applicants.

The Mr. and Mrs. P. A. Woodward's Foundation Medical Students' Fund—A gift from Mr. and Mrs. P. A. Woodward's Foundation provides assistance in the form of loans for undergraduate medical students in attendance at this University. Loans from this fund, repayable within a reasonable period after graduation, are arranged to meet the individual needs of applicants.

The Mrs. Amy E. Sauder Trust Fund—This fund, in the amount of approximately \$17,000, was established by donations from the estate of the late Mrs. Amy E. Sauder and from the E. L. Sauder Lumber Company Limited. In providing assistance for students beginning or continuing their studies at this University, the Fund serves to mark the desire of the late Mrs. Sauder, her family, and the Company to help young students who are worthy and deserving of support.

The Mr. and Mrs. T. Sato Loan Fund—This fund has been established by Mr. and Mrs. Tsutae Sato for students of Second Class standing, or better, in the Third or Fourth Years in the Faculties of Arts and Science, Agriculture and Applied Science, or for students in the Fifth Year of a Double Course. Loans from this fund do not bear interest until May 31st of the session in which they are granted, and are repayable in one year.

The Nursing Students' Assistance Fund—This fund has been established to provide loans for students in the School of Nursing. It is maintained by donations from friends and contributions received through the University Development Fund.

The Pacific Coast Branch, Technical Division, Canadian Pulp and Paper Association Student Aid Fund—This fund, established by the Pacific Coast Branch, Technical Division, Canadian Pulp and Paper Association, provides a fund for assistance in the form of loans to students in any year and faculty.

The Paul E. Murphy Student Aid Fund—From this fund, bequeathed by the late Paul E. Murphy of Ocean Park, loans may be obtained by undergraduates and graduates who have satisfactory standing and who are beginning or continuing their studies in the winter session at the University of British Columbia. Loans from this fund bear interest only after the recipient leaves the University, and are repayable in monthly instalments commencing one year after the date of leaving. Loans must be secured by a promissory note signed by the recipient and two guarantors. The recipient is also required to protect the loan by a policy of life insurance, in which the University shall be beneficiary to value, in an amount adequately covering advances made from the fund, until full repayment is made. Attention is called to the following clause in the agreement between the University and the late Paul E. Murphy:

“The donor and the University share the hope that students who have had help from this fund will themselves help others, as their means may allow, either by contributing to this fund or by establishing similar funds.”

The Pharmaceutical Association of the Province of British Columbia Student Aid Fund—This fund, established by the Pharmaceutical Association of the Province of British Columbia, provides assistance in the form of loans for students who have completed the First Year of Pharmacy and are continuing with further studies in the Faculty. Only those who are recommended by the Dean of the Faculty and the Scholarship Committee are eligible. Loans do not become repayable or bear interest until one year after graduation. Those who are assisted are invited to contribute, as their means may allow, to this fund.

Pi Beta Phi Loan Fund—Pi Beta Phi Fraternity has established a fund at the University for the use of Social Work students in financing their training or in meeting temporary or emergency needs. Loans, which are interest-free, will be made on the recommendation of the Director of the School.

The Ronald L. Cliff Student Aid Fund—This fund was established by a bequest from Ronald Lorraine Cliff to assist promising and deserving students who are attending the University. In providing this bequest, the donor expressed the hope that those who benefit from the fund would, if and when circumstances permit, contribute to the perpetuation and maintenance of it.

The Rotary Club of Marpole Student Aid Fund—This fund, donated by the Rotary Club of Marpole, has been established to provide financial assistance for worthy and deserving students in attendance at University.

The Roy Graham Memorial Loan Fund—In memory of Roy Graham, M.A.Sc. (Brit. Col.), Ph.D. (Chicago), a distinguished graduate of this University in Geological Engineering, a loan fund has been established by his family to assist worthy and deserving students in any year and faculty. Students in need of assistance may apply to the Dean of Inter-Faculty and Student Affairs, from whom further information may be obtained.

The Section of General Practice, B.C. Division, C.M.A., Student Aid Fund—This fund, initiated and maintained by annual contributions from the

Section of General Practice, B.C. Division, Canadian Medical Association, provides assistance for medical undergraduates. This assistance is in the form of loans which do not bear interest until after completion of the year of internship.

The Special Spring Session Students' Loan Fund—A sum of over \$2000, donated by the students of the Special Spring Session conducted in May and June, 1946, for ex-service personnel and former members of the Merchant Navy, provides a fund for loans. The order of preference is (a) ex-service personnel and former members of the Merchant Navy; (b) dependents of those in (a); (c) the student body at large.

Student Emergency Aid Fund—This fund, initiated by Robert Matchett, M.S.A., and maintained by gifts from students and graduates, provides loans for students requiring limited assistance in emergency situations.

The Tina and Morris Wagner Foundation Student Aid Fund—This fund, established through a bequest from Mr. and Mrs. Morris Wagner, provides loans for students in attendance at the University of British Columbia pursuing studies in the field of the humanities. In each case the conditions of repayment will be decided on the basis of the applicant's record and circumstances.

University General Loan Fund—The General Loan Fund was established by the Board of Governors. This fund, available for loans of limited amount, is open to students in need of pecuniary assistance. Loans, which must be repaid by August 31st, bear interest at the rate of 5 per cent per annum commencing on May 31st of the academic year in which they are granted.

The University Sopron Memorial Fund—This fund, originally established by the University to assist students in the Sopron Division of the Faculty of Forestry, provides loans for students in any year and faculty. In each case the conditions of repayment will be decided on the basis of the applicant's circumstances.

University Student Assistance Fund—Through the generosity of the late D. A. Hamilton of Vancouver, a fund has been established to assist selected students who would otherwise be unable to begin or continue their studies at the University. In making awards, consideration will be given to character, ability and promise.

The University Student Liberal Club Loan Fund—From this fund, sponsored by the University Student Liberal Club and maintained by donations from members of the Liberal Party, loans are available for students interested in public affairs. Loans are repayable, without interest, within one year, but in the case of students in attendance for further work, may be renewed under the same terms.

The University Women's Club of New Westminster Fiftieth Anniversary Loan Fund—This fund was established in 1956 by the University Women's Club of New Westminster, and was augmented in 1963 by an additional donation to commemorate the occasion of its fiftieth anniversary. The fund provides assistance, in the form of loans, for women students in any field taking courses toward a degree in the University winter or summer session.

The Vancouver Normal School Fund—This fund, given to the University when the Vancouver Normal School became a part of the University, provides assistance in the form of loans for students in the Faculty and College of Education.

Vancouver Provincial Normal School Graduates Student Aid Fund—From contributions made by graduates of the Vancouver Provincial Normal School at their reunion in June, 1956, and donated to the University, a fund of

approximately \$500 has been established to assist students in the Faculty of Education. From this fund loans in limited amounts will be made to students who, having been in attendance at the Winter Sessions, must attend the following Summer Session to complete requirements for teachers' certificates. Loans become repayable in one year and are interest free for that period.

The Walter D. Frith Student Aid Fund—This fund, established by gifts from Walter D. Frith, Esq., of Vancouver, is used to provide loans for students who, without financial assistance, are unable to begin or continue their studies at the University of British Columbia. To be eligible for loans, applicants must have satisfactory scholastic standing.

The Wesbrook Memorial Loan Fund—From this fund, established by a gift of the Graduating Class of 1928 as a memorial to the late Dr. F. F. Wesbrook, President of this University from 1913 to 1918, loans are available in limited amounts for undergraduates or graduates in regular attendance in the winter or summer session.

The Westcoast Transmission Student Loan Fund—This fund, donated by Westcoast Transmission Company Limited, provides loans for graduate students in the field of Mineral Engineering. Loans will be made to students recommended to the Scholarship Committee of the University by the Head of the Department of Mineral Engineering. Terms of repayment and other details will be decided on the basis of individual circumstances.

The Wheatley Memorial Loan Fund—The Association of Professional Engineers of the Province of British Columbia has established a loan fund in memory of Edward Augustus Wheatley who, as Registrar of the Association during the years 1921 to 1938, exerted a vital influence on the engineering profession, not only in this Province but throughout Canada. The fund is available to engineering pupils of the Association in attendance at the University, and all applicants for loans must be recommended by the Dean of the Faculty of Applied Science. Application should first be made to the Dean of Inter-Faculty and Student Affairs. Loans, which are interest-free until May 31st of the session in which they are granted, are repayable within one year.

The W. K. Kellogg Foundation Loan Fund—A grant from the W. K. Kellogg Foundation, Battle Creek, Michigan, provides a fund for loans to medical undergraduates.

The Worthington Memorial Chapter, I.O.D.E., Student Aid Fund—This fund, established by the Worthington Memorial Chapter, I.O.D.E., provides loans in limited amounts for students who are beginning or continuing studies in a full programme leading to a degree in any field. Applicants must have satisfactory academic standing. Terms and conditions of repayment are determined by the University on an individual basis.

The Worthington Memorial Loan Fund—This revolving loan fund was established by a bequest from the late Dr. G. H. Worthington, Vancouver, in memory of his sons, Lieutenant-Colonel Donald Grant Worthington and Major John Robert Worthington.

Special Funds for Women Students

Dean of Women's Fund—Through the generosity of several donors a fund has been established to assist women students who are temporarily in financial need. The fund is intended for use in emergency situations where limited assistance is required, and is administered by the Dean of Women.

Contributions have been received from the following:

Kappa Kappa Gamma Mothers' Club—Who donated \$100 during 1965.

Faculty Women's Club—Who donated \$300 during 1965.

PEO Sisterhood, Chapter AF—Who donated \$50 during 1965.

Mrs. Florence Buchanan—Who contributed \$20 during 1965.

Mrs. Shelagh Lindsey—Who contributed \$25 during 1965.

University of Toronto Alumnae—Who contributed \$100 during 1965.

Miscellaneous—\$105 during 1965.

The Mary L. Bollert Loan Fund—To honour the memory of the late Mary L. Bollert, first Dean of Women at the University of British Columbia, women graduates of the University and members of Miss Bollert's family have established a loan fund to assist women students. Those in need of an emergency loan should apply to the Dean of Women, on whose recommendation the Committee on Loans will arrange for payment. Loans are repayable in periods up to two years and will not bear interest during the period.

Summer Session Loan Funds

The Summer Session Students' Loan Fund—This fund, established in 1947, provides loans for students proceeding to a degree by University of B.C. Summer Sessions. A limited number of loans, to a maximum of \$150 each, are available to (a) teachers (as defined by the Public Schools Act of British Columbia) and (b) Non-winter session students who have previously completed at least six units by summer session at this University. Loans are available to teachers and non-teachers respectively in the same proportion as their numbers in attendance in the previous summer session. Loans are repayable in full by March 1st next, until which time no interest is charged. Application must be made to the Dean of Inter-Faculty and Student Affairs. Loans cannot be made until the beginning of summer sessions but those who will require loans may write in advance to determine whether they are eligible.

The University Summer Session Loan Fund—This fund provides loans limited at present to a maximum of \$100 for teachers registering for academic credit in the summer session. Loans are repayable by June 30th, and until that time do not bear interest.

AWARDS MADE BY OTHER INSTITUTIONS

The Rhodes Scholarships

The Rhodes Scholarships—The Rhodes Trustees offer annually for award in the Province of British Columbia one Rhodes Scholarship of the value of £750 a year. At most Colleges, and for most men, this sum is scarcely sufficient to meet a Rhodes Scholar's necessary expenses for term-time and vacations, and Scholars who can afford to supplement it by, say, £50 a year from their own resources are strongly advised to do so. The cost of the voyage to and from England must be borne by the Scholar.

The Scholarship is tenable ordinarily for two years at Oxford University. A third year (at Oxford or elsewhere abroad) may be authorized in proper cases.

A candidate must be a male Canadian citizen or British subject and have been ordinarily resident in Canada for at least five years by October 1st, 1966. A Rhodes Scholarship is forfeited by marriage after election, or during a scholar's first year of residence. Thereafter a Rhodes Scholar may marry and retain his stipend if he is able to give appropriate assurances of support and accommodation for his wife.

A candidate must be at least 19 but under 25 years of age on October 1st, 1967.

He must have completed two years of university study by October 1st, 1967.

A candidate may compete in a province in which he is eligible under either (a) or (b) below:

(a) The province in which he is ordinarily resident. If he is ordinarily resident in the North-West Territories he may compete in a province in which he is eligible under (b) or, if there is no such province, in Manitoba, Saskatchewan or Alberta. If he is ordinarily resident in Prince Edward Island he may compete in a province in which he is eligible under (b) or, if there is no such province, in Nova Scotia or New Brunswick.

(b) The province in which his university study has taken place, provided that if he is ordinarily resident outside Newfoundland he may not compete in Newfoundland.

In that section of the Will in which he defined the general type of scholar he desired, Mr. Rhodes mentioned four groups of qualities, the first two of which he considered most important:

1. Literary and scholastic attainments;
2. Qualities of manhood, truth, courage, devotion to duty, sympathy, kindness, unselfishness, and fellowship;
3. Exhibition of moral force of character and of instincts to lead and to take an interest in his fellows;
4. Physical vigour, as shown by fondness for and success in outdoor sports.

Some definite quality of distinction, whether in intellect or character, or both, is the most important requirement for a Rhodes Scholarship, and it is upon this that Committees will insist. Success in being elected to office in student organizations may or may not be evidence of leadership in the true sense of the word. Mr. Rhodes evidently regarded leadership as consisting in moral courage and in interest in one's fellow men quite as much as in the more aggressive qualities. Physical vigour is an essential qualification for a Rhodes Scholarship, but athletic prowess is of less importance than the moral qualities developed in playing outdoor games. Financial need does not give a special claim to a Scholarship.

A candidate for a Scholarship is required to make application by November 1st, 1966, and, if elected, to go to Oxford in October, 1967. Further information and application forms may be had from the Dean of Inter-Faculty and Student Affairs, University of British Columbia, Vancouver 8, B.C.

For Graduate Study

The Athlone Fellowships — The United Kingdom Government offers annually a limited number of fellowships to enable Canadian graduates in engineering to undertake special or advanced training in industry or in educational or research establishments in the United Kingdom. The fellowships cover the cost of travel, tuition, and maintenance, and are tenable for a period of two years. Further particulars may be obtained from the Dean of Inter-Faculty and Student Affairs or the Dean of Applied Science. Applications must be received by October 1st.

British Columbia Library Association Bursary—One or more bursaries, given by the British Columbia Library Association, are available annually for students intending to adopt librarianship as a profession. To be considered, an applicant must be eligible for acceptance in an accredited School of Librarianship. The recipient will be selected on the basis of scholarship,

personality, ability to work with others, aptitude for library work, physical fitness and financial need. It is to the student's advantage to have had some library experience. Application forms and further information may be obtained from the Director of School of Librarianship, U.B.C., or the Chairman, Bursary-Loan Committee, British Columbia Library Association, c/o School of Librarianship, U.B.C.

The British Columbia Teachers' Federation Postgraduate Scholarships for Teachers—The British Columbia Teachers' Federation offers annually four scholarships to teachers with a Bachelor's degree who are proceeding with studies toward a higher degree and have completed at least five years of successful teaching in British Columbia. Winners must give assurance of returning to educational service in British Columbia on completion of university studies. The Committee of Selection will consider only those applicants who have an overall standing in undergraduate studies of at least Second Class (in terms of University of British Columbia grades), with First Class in the particular area or areas in which they propose to major or take postgraduate work. These awards, which are tenable at any recognized university or college, are of two types: (a) two scholarships of \$1500 each for teachers taking leave of absence to engage in full-time studies in the regular University session; and (b) two scholarships of \$250 each for teachers proceeding to full-time studies in the regular summer session. The completed application form and all necessary documents must be received by the Scholarships & Awards Committee, B.C. Teachers' Federation, 1815 W. 7th Ave., Vancouver 9, B.C., not later than March 15th.

British Council Scholarships—The British Council offers scholarships to overseas students, normally tenable at universities and other educational institutions in the United Kingdom. The awards are mainly for men and women who have already completed university degree courses or who have equivalent professional qualifications. Preference is given to candidates between 25 and 35 years of age. The scholarships are normally for one academic year of 10 months or for two academic years (22 months), according to the duration of the approved course of study. A full scholarship is intended to cover all expenses of maintenance and study, and includes fares, fees, personal maintenance, a grant for books and apparatus and approved travelling expenses in the United Kingdom. Inquiry should be directed before the middle of October to the Executive Secretary, National Conference of Canadian Universities, 75 Albert St., Ottawa 4, Ontario.

The Canada Council Awards—The Canada Council offers scholarships, fellowships and grants in the fields of the arts, humanities, and social sciences. These include pre-doctor's degree fellowships; post-doctoral research fellowships; senior arts fellowships and arts scholarships for musicians, artists, writers and other workers in, and teachers of, the arts; short term grants in aid of research. The Canada Council administers post-doctoral research fellowships in interdisciplinary fields of engineering, medicine and science. Requests for application forms should be sent to the Awards Section, The Canada Council, 140 Wellington Street, Ottawa, Canada. Prospective applicants are advised to write before mid-October.

Canadian Federation of University Women Fellowships

Travelling Fellowship \$2,500—This is a pre-doctoral Fellowship open to any woman scholar who holds a degree from a Canadian University, has completed the Master's Degree or equivalent, is already well advanced on a Doctoral Programme, and wishes to continue her work outside of Canada. The candidate

must be a resident of Canada but she may be studying elsewhere at the time of application.

Margaret McWilliams Fellowship \$2,000—This is a pre-doctoral Fellowship open to any woman scholar who holds a degree from a Canadian university, has completed the Master's Degree or equivalent, and proposes to *embark* on a Doctoral Programme at an institution outside of Canada. The candidate must be a resident of Canada but she may be studying elsewhere at the time of application.

Junior Fellowship \$1,500—This Fellowship is open to any woman holding a Bachelor's Degree or equivalent from a Canadian university, who wishes to embark on a Course for the Master's Degree or equivalent and whose domicile is in Canada.

Professional Fellowship \$1,500—This Fellowship is open to any woman holding a Degree from a Canadian university, whose domicile is in Canada and who wishes to spend a year at an accredited library school, college of education, or similar professional school.

Information may be obtained from the Chairman of the Fellowship Committee, Miss Jean I. Royce, 140 Stuart Street, Kingston, Ontario. Applications must be completed and in the hands of the Chairman before 1 February.

The Canadian Foundation for the Advancement of Pharmacy Fellowship in Hospital Pharmacy—This fellowship of \$750 has been established to assist a graduate of a Canadian school of Pharmacy during a one-year programme of graduate studies in the field of hospital pharmacy, subject to the conditions outlined in the report of the Committee on Pharmaceutical Education and Research. Candidates should apply to the Secretary-Treasurer of the Foundation, 175 College Street, Toronto 2B, Ontario, prior to June 1st, setting out their plan of study and submitting a transcript of their academic record together with a letter of recommendation from their dean and at least one other person, preferably a practising pharmacist. The winner must agree to return to the practice of hospital pharmacy in Canada for at least one year.

The Canadian Institute of Chartered Accountants Research and Assistance Grants—The Canadian Institute of Chartered Accountants, together with the provincial Institutes of Chartered Accountants, has established a research and assistance grants programme with two main objectives: (1) To encourage the continuing improvement of accounting knowledge and to assist basic research in areas served by the accounting profession, and (2) To assist teachers of accounting to improve their own qualifications and education. While it is hoped that some of the grants awarded will result in publishable material—which the Institute would encourage either commercially or through its own publications programme—this prospect is not a requirement for an award. Initially, the programme will consist of two types of award: (1) Graduate Fellowships: Fellowships will be available to chartered accountants now teaching at a Canadian university who are candidates for a graduate degree in business; or to chartered accountants who are candidates for a graduate degree beyond a first master's degree and who are studying with a view to a teaching career in Canada. Fellowships to a maximum amount of \$2500 each will be awarded for one year. In particular cases a further grant of up to \$2500 may be made for a second year upon renewal of application. (2) Research Grants: Research Grants will be available to chartered accountants who are members of the teaching staff of a Canadian university to enable them to carry out research in accounting, auditing

or other areas of importance to the accounting profession. Grants to a maximum amount of \$2500 each will be awarded each year to allow such teachers to devote a reasonable amount of time to their chosen project and/or to meet out of pocket expenses for books, travel, stenographic or other assistance in connection with the project. A renewal of grant may be applied for if warranted by the project. A Graduate Fellowship or Research Grant may be held simultaneously with another scholarship, fellowship or similar award. Applications, setting out the academic and professional background of the applicant as well as complete details of the academic course or research project planned, should be sent in triplicate before 28 February to: The Director of Research, The Canadian Institute of Chartered Accountants, Chartered Accountants Building, 69 Bloor Street East, Toronto 5. Successful applicants will be notified of the terms of their award by 30 April.

Central Mortgage and Housing Corporation National Fellowships in Community Planning—It is expected that about 45 fellowships of \$3000 each will be made available by the Central Mortgage and Housing Corporation, Ottawa, for the study of community planning during the academic session of 1966-67. These will be awarded for study at any of the Canadian universities offering post-graduate training in Community and Regional Planning. The University of British Columbia is one of the universities offering instruction in this field. The purpose of these fellowships is to aid students in receiving advanced education which will enable them to enter the field of community planning and allied occupations either in a professional capacity or in public service. The academic qualifications of candidates must meet the requirements for graduate study at the university to which application is made and all candidates for a fellowship must have been accepted as graduate students at that institution. They will be required to undertake a prescribed course of studies. Thirty of these fellowships are for those entering graduate courses and fifteen for those in the Second Year of a Master's programme. Inquiries and applications should be directed to the Secretary of the Graduate Course in Community Planning at the University of British Columbia.

C.I.L. Fellowships in Wildlife Management—Canadian Industries Limited offers several post-graduate scholarships for research in wildlife management. The value of each fellowship is \$1500, of which \$1200 is awarded to the student and \$300 to the university to defray expenses. Applications must be submitted by the University on behalf of the student and must be forwarded by March 30th to J. W. Tomecko, Educational Relations Manager, C.I.L. Wildlife Management Fellowships, P.O. Box 10, Montreal, P.Q.

Commonwealth Scholarships—Under a plan drawn up at a conference held in Oxford in 1959, participating countries of the Commonwealth offer a number of scholarships to students of other Commonwealth countries. These scholarships are mainly for graduate study and are tenable in the country making the offer. Awards are normally for two years and cover travelling, tuition fees, other university fees, and a living allowance. The closing date for receiving applications for scholarships awarded by countries in the Northern Hemisphere is October 31st. For the dates of countries below the Equator and other details of Commonwealth Scholarships write to Canadian Commonwealth Scholarship and Fellowship Committee, c/o The Association of Universities and Colleges of Canada, 75 Albert Street, Ottawa, Ontario.

Consolidated Mining and Smelting Company Graduate Research Fellowship—The Consolidated Mining and Smelting Company offers annually ten

Graduate Research Fellowships. Each fellowship has the value of \$3000 of which \$2200 will be granted to the holder and \$800 to the University for the department in which research investigations are undertaken. At least five of the awards will be made to graduates undertaking study and research leading to an advanced degree in Canadian universities west of Ontario. They are open to any Canadian citizen who is a graduate in pure science, applied science, or agriculture of a recognized university who is planning research at a Canadian university leading toward a higher degree. The subject of the research investigation shall be in some field of pure or applied science 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. Application forms, required in duplicate, may be obtained from the Dean of Inter-Faculty and Student Affairs. They must be sent to the Director of Awards, Association of Universities and Colleges of Canada, 75 Albert St., Ottawa 4, Ontario, and must be received not later than February 1st. An application must be supported by letter of approval from the appropriate university authority stating that the applicant's plan of study and research has been accepted and may be undertaken at the university.

The Exhibition of 1851 Scholarship—Under the revised conditions for the award of the Exhibition of 1851 Scholarship in Science, the University of British Columbia is included in the list of universities from which nominations for scholarships allotted to Canada may be made. These scholarships, which are tenable for two, or in certain areas, three years, are of the value of £750 p. a., of which £100 is to be regarded as an allowance toward fees and research expenses. For Canadian students, the National Research Council of Canada supplements each scholarship by £250 a year. The scholarships are granted only to citizens of the British Commonwealth of not more than 26 years of age who have already completed a full university course and given evidence of capacity for scientific investigation. The scholarships are open to graduates of any university who have spent not less than three years in the study of science. Detailed information may be obtained from the Dean of Inter-Faculty and Student Affairs. Inquiry should be made before the end of December.

French Government Book Prizes and Medals—Book prizes and medals, offered by the French Government, will be awarded to students in French on the recommendation of the Head of the Department of Romance Studies.

French Government Scholarships—Scholarships of the present value of approximately \$800 are donated by the French Government for graduate study in France. They are tenable for an eight-month period. Travelling expenses for the return to Canada and university fees are defrayed by the French Government. These scholarships are open to students of all faculties. Candidates must, however, produce satisfactory evidence that they are able to profit by instruction given in French. The awards are made by the French Embassy on the recommendation of the University, from whom further information may be obtained.

The Imperial Oil Graduate Research Fellowships—Imperial Oil Limited in 1946 established for annual competition Graduate Research Fellowships, now five in number and having a potential value of \$7500 each (\$2500 a year for a maximum of three years). The fellowships are open to any graduate of any approved university in Canada and are offered for research leading to a Doctor's degree in the following fields: pure and applied natural and/or exact sciences, including mathematics—3 fellowships; social sciences and humanities

—2 fellowships. Nomination of students for the fellowships is made by the University—such nominations to be received by the Secretary of the Committee on Higher Education, Imperial Oil Limited, 111 St. Clair Avenue West, Toronto 7, not later than March 1st of each year.

Imperial Order Daughters of the Empire War Memorial I Scholarship (Canada and Overseas)—This fund was established by the I.O.D.E. in order to perpetuate the memory of the men and women who gave their lives in the defence of the Empire in the First Great War. Eight graduate scholarships to the value of \$2300 each are offered annually, one in each province of Canada. Each candidate must have done or be doing postgraduate work. The conditions under which they are awarded may be obtained from the Educational Secretary of the Provincial Chapter, I.O.D.E., 9031 Hudson St., Vancouver 14, B.C. *Applications must be submitted by October 15th of each year.*

Imperial Order Daughters of the Empire War Memorial II Scholarship (Canada and Overseas)—This fund was established by the I.O.D.E. in order to perpetuate the memory of the men and women who gave their lives in defence of the Empire in World War II. Six postgraduate scholarships to the value of \$2300 each are to be offered annually in Canada. Each candidate must have done or be doing postgraduate work. In view of the fact that for many years the emphasis for advanced study has been placed on science rather than on the humanities, these scholarships provided under War Memorial II will be offered annually to carry on postgraduate work in History, Philosophy, English or French Literature. The conditions under which they are awarded may be obtained from the Educational Secretary of the Provincial Chapter, I.O.D.E., 9031 Hudson St., Vancouver 14, B.C. *Applications must be submitted by October 15th of each year.*

International Fellowships for Women in Senior Graduate Work—The American Association of University Women Educational Foundation announces two fellowships in the Natural Sciences:

1. Sarah Berliner Fellowship in Physics, Chemistry or Biology;
2. Ida H. Hyde Fellowships in Euthenics or Eugenics.

These fellowships, open to women of any country represented in the International Federation of University Women, have a stipend of \$5000 each, require a doctorate in the field of research, and are unrestricted as to age or place of research.

The American Association of University Women Educational Foundation offers to women of other countries which are represented in the International Federation of University Women, thirty international fellowships of \$2500 each, for study in the United States, and a few international fellowships in any country other than the fellow's own.

The International Federation of University Women Committee for the award of International Fellowships announces: five AAUW awards of \$2500 each; the CFUW A. Vibert Douglas Fellowship of \$2000; the IFUW Winnifred Cullis Fund grants not exceeding 300 pounds sterling each; the IFUW Ida Smedley MacLean Fellowship of 850 pounds sterling; the FUWI (Bombay Branch) Grant approximately 370 pounds sterling; two NKAL (Denmark) Grants approximately 200 pounds sterling. These Fellowships are for research only and candidates must be full members of their national Federation of University Women.

Newnham College, Cambridge, offers the Ruth Holt Fellowship open to women of any nationality for research in the Natural Sciences. The value is 400 pounds sterling a year, together with free board and residence tenable

for three years from October. Applicants are expected to have reached at least the standard of a research student completing her work for the Ph.D. degree.

IFUW applications must be completed by November 1st; AAUW applications must be completed by December 1st; Newnham College applications must be completed by January 1st.

Canada may present a maximum of four candidates for the fellowships awarded by IFUW and four for those fellowships awarded by AAUW. Application forms may be obtained from: Miss Jean Royce, Chairman, Fellowships Committee, Canadian Federation of University Women, 140 Stuart St., Kingston, Ontario.

The International Nickel Graduate Research Fellowships in Engineering and Science—The International Nickel Company of Canada has established a number of Graduate Research Fellowships to promote and encourage research in the technical fields serving the Canadian metal industries and to further public interest in industrial science in Canada. Each has a possible tenure of three years with an annual payment of \$3500, of which \$3000 is payable to the fellow and \$500 is placed at the disposal of the directing professor for necessary materials or equipment. It is expected that eight new fellowships will be awarded in 1966. Applications on behalf of competent graduate students will be considered from any Canadian university qualified to confer the Master's or Doctor's degree in Chemistry or Physics of Metals, Geology (including Geophysics and Geochemistry), Metallurgy (both physical and extractive including Mineral Dressing), and Mining. Awards are made by a committee appointed by the Association of Universities and Colleges of Canada. Universities desirous of receiving one or more of these fellowships should address their applications to The International Nickel Company of Canada, Limited, 55 Yonge Street, Toronto 1, Ontario, not later than February 14. Not more than one application (either new or renewal) will be considered from any one university department annually.

International Nickel Graduate Research Fellowship in Mathematics—The International Nickel Company of Canada, Limited provides a graduate research fellowship in Mathematics for annual competition at Canadian universities. The award has a possible tenure of two years and is valued at \$3,000 annually. The Fellowship is open to qualified students who have an honours degree (or its equivalent) in Mathematics, or who expect to meet this requirement during the academic year in which they are proposed as candidates for the award. Application is made in letter form by the candidate's supervising professor to the International Nickel Company of Canada, Limited, 55 Yonge St., Toronto 1, Ont., prior to February 28.

The Johnson's Wax Fund Scholarship Award—The Johnson's Wax Fund, Racine, Wisconsin, through S. C. Johnson and Son, Limited, Brantford, Ontario, offers an award to pay for one year the reasonable expenses for travel to and study in the United States of at least one worthy and needy student (at a university or college of his or her choice) in postgraduate fields such as business administration, economics, chemistry, engineering, law, medicine, teaching, etc. An applicant must be a Canadian citizen, and must be recommended for the award by his or her university. Preliminary applications must be in Brantford by January 15th, accompanied by a letter of recommendation from the dean of the faculty or some other appropriate official. For further details consult the Dean of Inter-Faculty and Student Affairs before December 1st.

The Mackenzie King Travelling Scholarships—These scholarships of not less than \$1500 each are available for graduates of any Canadian university who propose to engage, either in the United States or the United Kingdom, in postgraduate studies in the fields of international or industrial relations. Information may be obtained from Dean Walter H. Gage, University of B.C., Vancouver 8, Canada. Applications for those proposing to proceed to study in the fall of 1966 must be submitted by March 1st, 1966.

National Research Council Postgraduate Scholarships and Postdoctorate Overseas Fellowships—The National Research Council awards annually a number of bursaries and studentships for graduate work. These are open to selected graduates in science and engineering who have shown distinction in their undergraduate studies. The values of the awards are as follows: bursary, \$2500 and studentship, \$3000. These awards are tenable for a period of twelve months. The National Research Council also awards a limited number of special scholarships and postdoctorate overseas fellowships for postgraduate study outside Canada. These awards extend over a twelve-month period and are in the following amounts: special scholarships, \$3000, and postdoctorate fellowships, \$4500 if applicant is single and \$5500 if married. Allowance will be made for travel. Applications must be received in Ottawa before January 15th. Application forms and regulations governing the awards may be obtained from heads of departments, the Dean of Inter-Faculty and Student Affairs, or from the Awards Officer, National Research Council, Montreal Road, Ottawa 7.

The PEO International Peace Scholarships—Believing that education is fundamental to world peace and understanding the members of the PEO Sisterhood contribute funds for the purpose of providing scholarships for selected women from other countries to study in the United States and Canada. The applicant must have full time graduate status and be working toward a degree in this University. She must state her intention to return to her own country on completion of her educational programme. Two or more awards of varying amounts of approximately \$600 per session will be made each year. Request for application forms should be made before December 1st. Further information may be obtained from the Dean of Women.

Rockefeller Brothers Theological Fellowship Program—One-year awards are available to enable students to study with expenses paid at any accredited protestant theological college in the United States or Canada. Fellowships are for male students with a Bachelor's degree, who are interested in the possibility of entering the ordained ministry, but who are not already committed to this career. Students wishing information may contact Dr. R. M. Clark, Department of Economics, Buchanan 2276, before November 1st.

Rotary Foundation Fellowships—The Board of Directors of Rotary International and the Rotary Foundation Trustees have established a number of Rotary Foundation Fellowships, each to the value of \$2500 approximately, for advanced study for a period normally of one year. Candidates are expected to pursue studies outside their own country. Preference will be given to a candidate who proposes to study in a country where the language is different from that of his own homeland and who is reasonably proficient in that language. These fellowships are open to unmarried male students between the ages of twenty and twenty-eight. Applicants must be graduates or in their graduating year. They are advised to make application early in the year to the Rotary Club in their home district. It is suggested that complete information be obtained from the Rotary Club of Vancouver or any other Rotary Club. These fellowships are awarded every other year.

Shell Postgraduate Scholarships—Shell Canada Limited provides two postgraduate scholarships tenable at Cambridge, Oxford, London or at such other university in the United Kingdom as may be indicated by the nature of studies which the scholar intends to follow. Each scholarship is valued at £1000 per annum for two years. An extension into a third year will be considered. Shell Canada Limited will provide travel assistance. Candidates should be male British subjects with at least five years residence in Canada, and under 25 years of age. They should have completed with high honours a first degree in science or engineering and have completed or expect to complete one year of postgraduate research in the field of study in which, if elected to a Shell Postgraduate Scholarship, they would propose during the succeeding two years to continue. They shall be prepared to take a two-year postgraduate course in one of the following: Chemistry, Physics, Chemical and other fields of Engineering, Geophysics, Geology. At the end of this period they will be expected to submit themselves for the degree of Master of Science or Doctor of Philosophy or such postgraduate degree as is awarded by the university attended. Application forms, obtainable from the Dean of Inter-Faculty and Student Affairs, must be submitted by January 20th to the Selection Committee, Shell Postgraduate Scholarships, c/o National Research Council, Ottawa, Ontario.

Viscount Bennett Trust Fund—Under the terms of a deed of gift to the Canadian Bar Association from the Right Honourable Viscount Bennett, P.C., K.C., LL.D., D.C.L., a fund known as the Viscount Bennett Trust Fund has been established. One half of the annual income from the fund or the sum of \$2500, whichever is less, will be paid annually to each of two students as a scholarship for postgraduate study at an institution of higher learning to be approved by a committee, provided however that if a recipient of a Viscount Bennett Scholarship is also in receipt of other scholarships, bursaries or prizes to assist in postgraduate work and the total of all such awards, including the Viscount Bennett Scholarship, exceeds \$4000, the amount paid under the Viscount Bennett Scholarship will be reduced by the amount of the excess. The scholarship is open to a person of either sex who has graduated from an approved law school in Canada or who, at the time of application, is pursuing his or her final year of studies as an undergraduate student at an approved law school. The awards will be made by the Council of the Association at the mid-winter meeting of the Council. The Faculty of Law of this University has been approved by the Committee. Full information as to qualifications of applicants may be had on application to the Dean of Inter-Faculty Affairs or the Dean of the Faculty of Law. Applications must be in the hands of the Secretary, The Canadian Bar Association, Room 320, 90 Sparks St., Ottawa, Ontario, by December 31st.

The Woodrow Wilson National Fellowships—The purpose of these fellowships is to attract men and women to the profession of college teaching in the humanities and the social and natural sciences. Outstanding seniors and graduates who are not registered in a graduate school are eligible for nomination provided they are, or intend to become, Canadian or U.S. citizens and are seriously considering a career in college teaching. Successful nominees must undertake a full programme of graduate study in a U.S. or Canadian graduate school; only in exceptional circumstances will Fellows be allowed to remain at the university where they have done their undergraduate work. The stipend is \$2000; married male Fellows with children also receive \$1000 for the first child and \$250 for each additional child. Tuition fees are paid directly to the Fellow's graduate school by the Foundation. Nominations for Woodrow Wilson Fellowships are by faculty members and are made early in the academic session;

students should indicate their interest to a faculty member as soon as possible after registration in their final year.

For Undergraduates

The Alliance Francaise Scholarship—This scholarship is offered in alternate years through L'Alliance Francaise de Vancouver to a member of the University group of the Alliance. It provides for a stay of four weeks at the residence of the French Alliance in Paris during which time the winner must attend, without fee, the lectures of the practical school (Ecole Pratique), as well as two weeks travelling time in France and for a further six-week stay at the University of Bordeaux Summer School in Pau during which time the winner must attend, without fee, the lectures at the University. The largest part of the cost of transportation from Vancouver to France and return is provided by several benefactors. A contribution of \$150 toward expenses will also be made by the University. The winner of this award, valued at at least \$1500, is selected in consultation with the University.

The Aubrey A. Brown Memorial Award in Pharmacy (donated by the Canadian Foundation for the Advancement of Pharmacy)—A cash prize of \$100, together with a gold medal and a certificate of merit, will be awarded annually by the Canadian Foundation for the Advancement of Pharmacy to the student in the graduating class in any College, School, or Faculty of Pharmacy in Canada, who, in the opinion of the Awards Committee appointed by the Foundation submits the best paper on some phase of pharmacy administration, pharmaceutical history (particularly Canadian), or on any topic having some clear connection with the practice of retail or hospital pharmacy. Further information may be obtained from the Dean of the Faculty of Pharmacy. The closing date for receiving applications is April 15th.

The B.C. Indian Arts and Welfare Society Memorial Bursary—A bursary of \$100 will be awarded annually by the B.C. Indian Arts and Welfare Society in memory of those Indian Canadians who gave their lives in either World War. Applicants must be from the Vancouver Island Educational District and be planning to enter the University of British Columbia, University of Victoria, or some recognized Technical School or other training centre. The award will be made by the Executive Committee of the B.C. Indian Arts and Welfare Society in consultation with the Superintendent of Indian Education on Vancouver Island.

The B.C. Women's Institute Memorial Scholarship in Home Economics—A scholarship of \$250 will be awarded annually by the Women's Institute of B.C. It is available to the daughter of a member of a Women's Institute of B.C. The member must have been in good standing for at least three years. Preference is given to a student registering at the University toward a degree in Home Economics. Applications by letter from the sponsoring Institute to the Secretary-Treasurer, Provincial Board, B.C. Women's Institute, 545 Superior St., Victoria, B.C., must be received before August 1st.

The B.C. Women's Institute Memorial Scholarship in Agriculture—A scholarship of \$250 will be awarded annually by the Women's Institute of B.C. It is available to the son or daughter of a member of a Women's Institute of B.C. The member must have been in good standing for at least three years. Preference is given to a student registering at the University toward a degree in Agriculture. Application by letter from the sponsoring Institute to the Secretary-Treasurer, Provincial Board, B.C. Women's Institute, 545 Superior St., Victoria, B.C., must be received before August 1st.

The British Columbia Teachers' Federation Undergraduate Scholarships for Teachers—The British Columbia Teachers' Federation offers annually six scholarships tenable at the University of British Columbia, at the University of Victoria, or at Simon Fraser University. An applicant must be actively engaged in teaching in the Province, must hold a B.C. Teaching Certificate, must have high academic standing (an overall average of at least Second Class, in terms of University of British Columbia grades, with First Class in the particular area or areas in which he proposes to major), and must give assurance of returning to educational service in British Columbia on completion of his University studies. The awards are of two types: (a) two scholarships of \$1500 each for teachers taking leave of absence to proceed in a full programme of studies in the regular winter session toward a B.Ed. degree. One scholarship is for the elementary field, the other for the secondary field. (b) Four scholarships of \$250 each for teachers proceeding in a full programme of studies in the summer session toward the B.Ed. degree. Two of the scholarships are for the elementary field and two for the secondary field. The completed application form and all necessary documents must be received by the Scholarships & Awards Committee, B.C. Teachers' Federation, 1815 W. 7th Ave., Vancouver 9, not later than March 15th.

The British Columbia Teachers' Federation Scholarships in Teacher Training—The following scholarships, the gift of the British Columbia Teachers' Federation, are offered annually to students proceeding to a degree or certificate in the field of elementary or secondary school teaching:

- (1) two scholarships of \$250 each, available to students continuing in the Faculty of Education, from Grade XIII or First Year University;
- (2) two scholarships of \$250 each, available to students continuing in the Third Year in the Faculty of Education;
- (3) two scholarships of \$250 each, available to students continuing in the Fourth Year in the Faculty of Education;
- (4) two scholarships of \$250 each, available to students continuing in the Fifth Year of the Programme for the degree of B.Ed. in the secondary teaching field or entering the one-year teacher training programme for graduates.

All of the above scholarships are tenable at U.B.C., University of Victoria or Simon Fraser University.

All awards will be made on the basis of academic standing, personal qualities, and aptitude for and interest in teaching. Except in the case of the scholarships (1) and in the case of graduates from other faculties, the scholarships (4), only those students who have achieved First Class standing in practice teaching will be eligible. Applications, on forms available from the Scholarships and Awards Committee, B.C. Teachers' Federation, 1815 W. 7th Ave., Vancouver 9, must be submitted to the Federation not later than May 15.

The Central Mortgage and Housing Corporation Travelling Scholarships in Architecture—Seven scholarships may be awarded to undergraduates who are proceeding to their Final Year at a School of Architecture in Canada. Winners will receive expenses to travel as a group to selected housing projects in Canada and the United States for a period of four to five weeks. After completion of the tour, conducted by a staff member of one of the schools, students will be required to work at the Head Office of C.M.H.C. for eight weeks to gain experience in housing, during which period they will be paid a salary of \$65 a week. Each student will be expected to submit a paper on the summer's tour and work experience to the director of his school, and on

receipt of this paper by C.M.H.C. through the director, will receive \$500. Winners will be chosen on the basis of scholastic achievement and marked interest in housing. Awards are available only to Canadian citizens or landed immigrants in Canada. Applications must be submitted to the School of Architecture by March 15th.

The Chilliwack University Women's Club Bursary—A bursary of \$100 is offered to a woman student of the Chilliwack district who has completed Second or Third Year University in any faculty and who is continuing her University education. The Chilliwack district comprises the following postal areas: Chilliwack, Sardis, Yarrow, Cultus Lake, Lindell Beach and Rosedale. Application forms should be obtained from and returned to Mrs. John R. Peers, R.R. 1, Yarrow, B.C., before July 5, 1966.

Cominco Undergraduate Scholarships—The Consolidated Mining and Smelting Company of Canada Limited offers annually a number of scholarships fuller details of which should be obtained from the Secretary, Scholarship Committee. The Consolidated Mining and Smelting Company of Canada Limited, Trail, B.C. Applications, on special forms available at the above address, must be postmarked not later than June 1st and forwarded to that address. These awards include: (a) Two major awards of \$1400 each payable \$350 each per year. Known as Cominco Undergraduate Scholarships, Class 1, they are open in competition at the Senior Matriculation or equivalent level (i.e. equivalent First Year University) to sons and daughters of Cominco employees. (b) Four one-year awards of \$300 each, known as Cominco Undergraduate Scholarships, Class 2, are open in competition to sons and daughters of Cominco employees. These awards are also based on Senior Matriculation or equivalent level. (c) Two one-year awards of \$300 each, known as Cominco Undergraduate Scholarships, Class 3, open in competition to all students who are attending high schools in School Districts Nos. 1-11 inclusive, which cover the East and West Kootenay Districts of British Columbia. These awards are based on Senior Matriculation only.

Crown Zellerbach Canada Foundation Scholarships for Teacher Training—Seven scholarships of \$2000 each, payable in yearly instalments of \$400 for five years, are offered annually by Crown Zellerbach Canada Limited to high school graduates beginning studies at the University of B.C., University of Victoria, or Simon Fraser University, and planning to enter the secondary teaching profession. One award will be available, in each of the following school districts: Courtenay-Comox; Campbell River; Ladysmith (Ladysmith High School only); Nanaimo; Ocean Falls; Richmond School District No. 38; and the combined area of New Westminster School District No. 40, Coquitlam School District No. 43, and Surrey School District No. 36. Selection of the winners of the scholarships, which are open to students whose parents reside in these districts, will be made by the School Boards concerned, on the basis of scholastic standing, leadership, citizenship, and suitability for the teaching profession. Application to compete should be made to the high school principal. Yearly renewals to winners will be dependent upon maintenance of good academic standing.

Elizabeth Bentley Eastern Star Scholarships—Three scholarships (at least) of \$400 each are given annually by the Order of the Eastern Star to students who are attending any degree granting university approved by the Provincial Department of Education of B.C. The applicants shall be a member, or the wife, husband, father, mother, sister, brother, son or daughter, or legally adopted child of a member of a Chapter of the Order of the Eastern Star in British Columbia. Names of eligible students with complete information and photostatic copies of their marks are forwarded (on completion of Third Year)

by the various chapters to the Grand Secretary of the Grand Chapter of British Columbia, to be received in that office not later than July 31st. The awards are made to the students entering the final year of undergraduate studies with the highest average in all subjects in the two previous (not essentially consecutive) scholastic years. Further information may be obtained from Mrs. Hazel Freeze, Grand Secretary, 4767 Collingwood Street, Vancouver 8, B.C.

The E. L. Woods Memorial Prize in Pharmacy (donated by the Canadian Foundation for the Advancement of Pharmacy)—A cash prize of \$100, together with a gold medal and a certificate of merit, will be awarded annually by the Canadian Foundation for the Advancement of Pharmacy to the student in the graduating class in any College, School, or Faculty of Pharmacy in Canada, who, in the opinion of the Awards Committee appointed by the Foundation submits the best paper on some phase of laboratory research in pharmacy. Papers entered for this award will be selected by the Faculty of Pharmacy from the theses submitted as part of the Fourth Year requirements. The closing date for receiving applications is June 1st.

Hector J. MacLeod Scholarship—The Vancouver Section of the Institute of Electrical and Electronic Engineers, in honour of Dr. H. J. MacLeod, Dean Emeritus, Faculty of Applied Science, offers annually in recognition of his pioneering efforts in education and science, a scholarship of \$350.00 to a student registered in Electrical Engineering. The award will be made to either an undergraduate or graduate student who has attained high scholastic honours and demonstrated initiative in his chosen field.

The IBM-Thomas J. Watson Memorial Scholarship—Two scholarships, each ranging from \$200 to \$1000 and based on individual need and the cost of studies concerned, are offered each year in competition by International Business Machines Company Limited, Don Mills (Toronto), to children of (a) regular employees; (b) retired employees; (c) deceased employees who died while employed; (d) employees receiving total and permanent disability benefits from IBM; (e) employees on an authorized leave of absence. Each scholarship is renewable, in an amount to be determined annually, for three further years subject to maintenance by the holder of a "B" average. Applicants who have completed or will complete the prescribed secondary school course necessary for University entrance prior to the commencement of the university year, are eligible to apply. Awards are tenable at a Canadian University (or an affiliated college) which is a member of the National Conference of Canadian Universities and Colleges. Selection of the winners will be made by a committee appointed by the Canadian Universities Foundation. Financial need will not be a factor in the selection. A minimum average grade of 70% in the University entrance year is a prerequisite. Winners will not be permitted to hold other awards.

Imperial Oil Higher Education Awards—Imperial Oil Limited offers annually free tuition and other compulsory fees to all children or wards of employees and annuitants who proceed to higher education courses. The courses may be taken at any Canadian university or other approved institution of higher learning. Each award is tenable for a maximum of four years. To be eligible a student must attain an average mark of 70% in the appropriate secondary school examinations in the subjects required for admittance to the approved institution. Further information and application forms may be obtained from the Secretary, Committee on Higher Education, Imperial Oil Limited, 111 St. Clair Avenue West, Toronto 7, Ontario.

The Independent Order of Odd Fellows Bursaries—Six bursaries of \$250 each, provided by the Grand Lodge of B.C., I.O.O.F., the Grand Encamp-

ment, and the Rebekah Assembly, are available annually for students in any year of any faculty. The awards will be made by a joint committee consisting of two representatives from each of the Grand Bodies. All applicants must have direct connection with one or more branches of the Order, through parents, grandparents, or close relatives. Special consideration will be given to applicants with financial need. Full details of the awards and application forms may be obtained from the Secretary of any Odd Fellows Lodge or Rebekah Lodge, I.O.O.F. Applications should be submitted to the Odd Fellows or Rebekah Lodge by April 1st so that they may be received by the Committee not later than April 15th. All applications must be sponsored by an Odd Fellows Lodge, Rebekah Lodge, or Encampment.

The above Committee will award annually an additional bursary of \$200 to a student in a recognized theological college of university status. This bursary will be known as the Dr. A. M. Sanford Memorial Bursary. Applicants will follow the same procedure as for all other I.O.O.F. bursaries, except that family connections with the I.O.O.F. will not be required.

Irene Samuel Bursary Fund—These awards are available for young Jewish women students who have demonstrated leadership ability through participation in youth groups, organizational work, and similar extra-curricular activities, as well as aptitude for an academic career as indicated by performance at high school. Awards are tenable at any approved Canadian university. Application by letter should be made to Mrs. Julia Schulz, Executive Director, National Council of Jewish Women of Canada, 4700 Bathurst Street, Second Floor, Willowdale, Ontario, before May 1st. The letter of application should contain name, age, academic standing and details of course to be entered, extra-curricular activities, family background (how many in family, occupations of parents), financial requirements, summer occupations and earnings, other awards applied for, and similar pertinent facts. References should also be supplied.

The International Woodworkers of America, Local 1-80, Bursary—The International Woodworkers of America Local 1-80 offers a Bursary in the amount of \$400.00 open in competition to all I.W.A. Local 1-80 members or a wife, son, or daughter of an I.W.A. Local 1-80 member. For the purpose of eligibility in applying for the Bursary, the wife, son, or daughter of a deceased I. W. A. Local 1-80 member in good standing at the time of his decease, or a member who has retired from the industry because of age or disability and holds a retirement card from this Local Union, shall also be deemed eligible.

In making the award, the Bursary Committee will be guided by the following:

1. The average marks obtained by the Grade XII student during that school term.
2. Indication of need.
3. All applicants must be on the University programme proceeding to any degree granting University, or to the B.C. Institute of Technology.

All those desiring to compete must notify Ed. Linder, Financial Secretary of the I.W.A. Local 1-80, Box 430, Duncan, B.C., by a letter not later than May 15th, 1966. The I.W.A. Local 1-80 reserves the right to withhold the Bursary if no candidate makes sufficiently high standing.

Langley Scholarship Fund—Information regarding the following awards may be obtained from N. A. Sherritt, Chairman, Langley Scholarship Fund, c/o Langley Secondary School, Langley, B.C.:

- (1) **Langley Memorial Hospital Medical Staff Bursary**—A scholarship of

\$100 open to graduates of Langley or Aldergrove High Schools, proceeding to First Year Medicine at the University of British Columbia or other approved university. Applications required by June 15th.

(2) **Langley Pharmacists Scholarship**—A scholarship of \$100, open to graduates of Langley or Aldergrove High Schools, proceeding to the First or higher year in Pharmacy at the University of British Columbia or other approved university. Applications required by June 15th.

(3) **Langley Anglican Theological Scholarship**—A scholarship of \$100 open to graduates of Langley or Aldergrove High School enrolling or enrolled in Anglican Theological College. Applications required by June 15th.

(4) **Alex Woykin Memorial Scholarship**—A scholarship of \$100, open to graduates of Langley High School proceeding to the First or higher Year in Engineering at the University of B.C. or other approved university. Applications required by June 15th.

Leonard Foundation Scholarships—This National Foundation awards each year a number of scholarships for which students of the University of British Columbia are eligible. Application forms and further information may be secured from Professor C. W. J. Eliot, University of B.C., a member of the General Committee of the Foundation. These forms should be forwarded to the Honorary Secretary of the Foundation, c/o Canada Permanent Toronto General Trusts Corporation, 253 Bay Street, Toronto, not later than March 31st of each year. Whenever possible these applications should be filed in February, the awards are made at the annual meeting of the General Committee on the fourth Friday in May.

The Michael Bowker Memorial Bursary—A bursary of \$200, the gift of the Medical Clinic of Dr. H. A. Bowker and Dr. J. W. Neville, is offered to students proceeding from Grade XII or XIII at Ladysmith Secondary School to a full programme of studies at the University of British Columbia. The winner will be selected by the Scholarship Committee of the School on the basis of academic standing, and interest and participation in school and community activities.

MacMillan, Bloedel and Powell River Limited Scholarships—Nine scholarships of \$500 each, one in each of School Districts 65 (Duncan-Cowichan), 67 (Ladysmith-Chemainus), 68 (Nanaimo), 69 (Qualicum), 70 (Alberni), 79 (Ucluelet-Tofino), 48 (Howe Sound), and two in School District No. 47 (Powell River), are offered by MacMillan, Bloedel and Powell River Limited. These scholarships are open to students beginning their studies at the University of British Columbia or affiliated Theological Colleges on the Campus, the University of Victoria, or Simon Fraser University. Awards will be made on the basis of academic ability and potential leadership as indicated by grade achievements in Grades XI and XII and participation in school activities. Further information may be obtained from the Principal of the School.

MacMillan, Bloedel and Powell River Limited Bursaries to Inter-Term (or Vacation Relief) Employees—MacMillan, Bloedel and Powell River Limited offers annually a number of bursaries to part-time employees who will be returning for further study at the University of British Columbia, the University of Victoria, Simon Fraser University or the British Columbia Institute of Technology. The total amount of such bursaries shall not exceed \$2,500 in any one year. Amounts of individual awards are not fixed. Selection of recipients will be determined by the student's interest in the forest industry, his success during part-time employment, and his financial need. Further details may be

obtained by the student from the Personnel Supervisor at the Division where he is employed.

MacMillan, Bloedel and Powell River Limited Special Scholarships for Dependents of Employees—Ten scholarships of \$500 each, offered by MacMillan, Bloedel and Powell River Limited, are available annually to sons and daughters (or legal dependents) of employees of the Company serving in any MacMillan, Bloedel and Powell River Limited Division in North America. Because the majority of employees work in British Columbia, it is expected that most will be awarded in B.C. However the diversity of the Company's sales operations will make it possible for awards to be made in other Provinces and in the United States. These scholarships are open to students beginning their studies at the University of British Columbia or affiliated Theological Colleges on the Campus, the University of Victoria, or Simon Fraser University. Awards will be made on the basis of academic ability and potential leadership as indicated by grade achievements in Grade XI and XII and participation in school activities. Further information may be obtained from the Personnel Supervisor at the Division at which the parent is employed.

Northern Electric Employee Bursaries—The Northern Electric Company Limited has provided for a number of bursaries to an annual maximum value of \$500 each to assist employees of the Company and their dependents to obtain a university education. The applicants must have completed previously one year of undergraduate studies at a recognized university. Application forms obtainable from the Company should be submitted directly to the Northern Electric Training Advisory Committee, Dept. 107, P.O. Box 6123, Montreal, P.Q. before July 31st.

The Ocean Falls Local No. 312, International Brotherhood of Pulp, Sulphite and Paper Mill Workers Scholarship—A scholarship of \$250, given by Ocean Falls Local No. 312, of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, is available annually for a student entering First Year at the University of British Columbia. This scholarship, which is restricted to students of Charleson High School, Ocean Falls, B.C., will be awarded to the applicant who meets the following conditions: (1) obtains highest standing in the written examinations in the scholarship subjects for High School Graduation (University Programme); (2) qualifies for no other scholarship or bursary award. Without prejudice to any of the above conditions, the Executive of Local No. 312 reserves the right to consider any application on its own individual merits and make the award accordingly. Further information may be obtained from the Secretary, Ocean Falls Local No. 312, I.B.P.S. & P.M.W., Box 190, Ocean Falls, B.C.

Pacific Veneer Social Club Scholarship—This scholarship of \$300 is offered annually to the children or grandchildren of active members of the Pacific Veneer Social Club. It is open to students proceeding from Grade XII or XIII in a British Columbia school and proceeding to university in the fall in a full degree programme. All candidates must write a full set of examinations conducted in June by the Department of Education, B.C. An intending candidate must submit a letter of application to the Secretary of the Club, not later than June 30th, giving his full name, age and address; name and address of school he is attending; name and address of member of the Social Club to whom he is related; name of university he will attend; and a brief account of his interest and participation in school and community activities. Further details may be obtained from the Secretary of the Club, P.O. Box 140, New Westminster, B.C.

Prince George and District Dental Society Bursary—The Prince George and District Dental Society offers a bursary of \$200, to a graduate of the

Prince George High School who has begun his first year of training in an accredited dental school. Application may be made to the Prince George and District Dental Society and the recipient of this bursary will be judged primarily on his or her financial need and scholastic standing.

Royal Canadian Engineers Memorial Scholarship—Scholarships of \$125 each are offered annually to a number of universities in Canada, of which the University of British Columbia is one. These scholarships, established in memory of all ranks of The Corps of Royal Canadian Engineers who gave their lives in the Second World War, are awarded to selected students who have successfully completed their second to last year in a course leading to a degree of Bachelor of Applied Science, Bachelor of Engineering, Bachelor of Architecture or an equivalent degree in the field of Applied Science or Engineering, who are members in good standing of the Canadian Officers' Training Corps at the college or university which they are attending, and who have successfully completed at least one summer season's training with such unit or as a member of such unit; or who are ex-members of the Canadian Officers' Training Corps who have successfully completed two years of COTC training and have transferred to the Canadian Army (Militia) or the Canadian Army (Supplementary Reserve); or who are members of the Canadian Army (Regular), attending college or university under the terms of the Regular Officers' Training Plan. Awards, made by the Royal Canadian Engineers Memorial Scholarship Committee, Ottawa, are based on academic standing and qualities of leadership, as evidenced by participation in activities of the Officers' Training Corps and student affairs generally. Where two or more candidates from one university are considered equally meritorious, preference is given, firstly to a candidate who is the son of a member or a former member of The Corps of Royal Canadian Engineers, and secondly, to a cadet who has applied as his first choice for a commission in the Corps, either Regular or Militia. The Committee may, at its discretion, award more than one scholarship to a university or college when the yearly quota of scholarships is not fully taken up by the institutions eligible.

Royal Canadian Legion (Pacific Command) Bursary/Scholarships—The Royal Canadian Legion (Pacific Command) offers annually a number of awards for students proceeding from secondary school to university. These scholarships are awarded on the basis of academic standing, financial need, and participation and achievement in student and community affairs. Preference is given to sons and daughters of deceased, disabled, or other veterans, but applications from other worthy students are also considered. Further information may be obtained from Pacific Command, The Royal Canadian Legion, 1531 West Pender St., Vancouver 5, B.C.

The Saint Thomas More Law Burses—Three bursaries of \$250 each, sponsored by the Catholic Lawyers' Guild and provided by the Catholic Archdiocese of Vancouver, are offered to Catholic students entering, or presently in, the Faculty of Law. The winners will be selected by the Guild. Information may be obtained from Thomas O. Griffiths, President, Catholic Lawyers' Guild, 816-821 Rogers Building, 470 Granville St., Vancouver 2, B.C.

The Sir Charles Tupper Chapter I.O.D.E. Bursary—A bursary of \$75 will be awarded to a student entering University from Sir Charles Tupper School. This award will be made to one who intends to become a teacher. Consideration will be given to natural aptitude for this profession, ability and financial need.

The Summerland Scholarship—A scholarship of \$250, given by the citizens of Summerland, is available annually for a student of Summerland High

School proceeding to the University of British Columbia, or some other institution of higher learning in the event that courses of the winner's choice are not available at the University of British Columbia. The scholarship will be awarded to the applicant who, in the opinion of the Summerland Selection Committee, best exemplifies the qualities of the all-round student. If two applicants are considered equal in qualifications, the scholarship is divided. If, however, sufficient funds are available, two scholarships are awarded in one year.

Thurb D. Cushing Scholarship—The Vancouver Section of the Institute of Electrical and Electronic Engineers, in memory of the late Thurb D. Cushing, formerly Vice-President and Engineering Manager, Lenkurt Electric Co. of Canada, Ltd., awards annually a scholarship of \$250. In recognition of Mr. Cushing's enthusiastic leadership and engineering contribution in telecommunications. The award will be made to an undergraduate in Electrical Engineering who has shown high scholastic attainment and has demonstrated an interest in student affairs, particularly in the Student Branch of the I.E.E.E.

The Westminster Regiment Association Scholarship—This scholarship of \$500, the gift of the Westminster Regiment Association, will be awarded annually to a worthy and deserving student who is continuing his or her formal education beyond secondary school in recognized institutions of higher learning in any place within Canada or outside Canada. To be eligible, applicants must be direct descendants, male or female, of a member of the Westminster Regiment Association, of a member of the Westminster Regiment CA(M) or of one of those battalions which the Westminster Regiment perpetuates, i.e., the 47th, 104th or 131st. The applicant may be in his or her final year of secondary school or any year of post secondary study, and may be resident in any place within Canada or outside Canada. The basis of the award will be academic standing in previous studies and need of financial assistance. The Application for Scholarship Form is obtainable from the Scholarship Committee, The Westminster Regiment Association, Box 854, New Westminster, B.C. The cut-off date for applications is July 31st.

The West Point Grey Branch (B.C. No. 142) Royal Canadian Legion Scholarship—A scholarship of \$350, given by West Point Grey Branch No. 142, Canadian Legion, and the Ladies' Auxiliary, is offered to students graduating from high schools in the community served by the Branch and beginning studies in the fall at the University. Preference will be given to the son or daughter of a veteran. Further information may be obtained from the Secretary-Manager of Branch 142, Alma Hall, Broadway at Alma Rd., Vancouver 8, B.C.

The William Gray and Alan J. MacSween Scholarships—Five scholarships of \$200 each are offered by the North Vancouver Teachers' Association to students proceeding to studies at the University toward a degree or certificate in the teaching field. One scholarship will be awarded to a graduate of each of the following: Argyle Secondary School, Delbrook Senior Secondary School, Handsworth Secondary School, North Vancouver Senior Secondary School and Windsor Secondary School. The awards will be made on the basis of academic standing, personal qualities and character, interest and participation in school and community affairs, and aptitude for teaching. Letters of application giving information pertinent to the above qualifications, and accompanied by two letters of recommendation, must be submitted to "The Scholarship Committee" c/o The Principal, of any of the above named schools, North Vancouver, not later than June 1st.

Loan Funds

The British Columbia Library Association Loan Fund—This loan fund is available to students who wish to attend an accredited school of librarianship. The recipient will be selected primarily on the basis of financial need and aptitude for library work. Application forms and further information may be obtained from the Director of the School of Librarianship, U.B.C., or from the Chairman, Bursary-Loan Committee, British Columbia Library Association, c/o School of Librarianship, U.B.C.

The Canadian Arthritis and Rheumatism Society Bursary Loans—The Canadian Arthritis and Rheumatism Society offers bursary loans of up to \$500 per annum to students qualifying for first, second or third year training in the School of Rehabilitation Medicine at U.B.C. Conditional upon employment with C.A.R.S., repayment of the loan may be waived. Particulars and application form may be obtained from: C.A.R.S., 645 W. Broadway, Vancouver 9, B.C.

The Harry F. Bennett Educational Fund of the Engineering Institute of Canada—This fund was established by subscription from members of the Engineering Institute of Canada in memory of the late Harry F. Bennett, M.E.I.C., who for six years was Chairman of the Institute's Committee on the Training and Welfare of the Young Engineer. One purpose of the fund is to provide loans for deserving students who need financial assistance to enable them to study engineering sciences at university level, and who have successfully completed the First Year in Engineering. Loans will be made largely on the basis of character and qualities essential to leadership. Application blanks may be obtained from the office of the Dean of Inter-Faculty Affairs, or from The Trustees, Harry F. Bennett Educational Fund, 2050 Mansfield St., Montreal 2, Quebec.

Maude Abbott Memorial Scholarship Loan Fund—This fund was established by the Federation of Medical Women of Canada. Loans up to Three Hundred and Fifty Dollars are available to any woman medical student or first year interne. A second loan up to Three Hundred and Fifty Dollars may be granted to a previous recipient. In special cases, a loan up to One Thousand Dollars may be granted to a medical woman for recognized post-graduate training. Loans are payable within seven years of date of issue, after which time, interest will be charged at the rate of 5% compounded annually. Information regarding these loans may be obtained from Dr. Lucille Ellison, 1207 - West 40th Avenue, Vancouver, B.C.

The PEO Sisterhood Educational Loan Fund—Loans are available to women students in any year of a university course, and may be requested at any time. The maximum amount of a loan to any student is \$1250. Fourth year or graduate students may be granted loans and draw the maximum loan in one year. Undergraduates may apply for and be granted the maximum loan of \$1250 for two or more years of study, but may draw only \$625 of the loan in one academic year. Freshmen must complete one term's work satisfactorily before making application. Loans are made for periods up to five years. Interest at the rate of 4% is to be paid annually, and the student is expected to begin payment of the principal as soon as she is out of university and employed. Further information may be obtained from the Dean of Women.

CUS INTERREGIONAL SCHOLARSHIP EXCHANGE PLAN

Through this plan the Canadian Union of Students offers to Canadian students the opportunity to study for one year at a university in another part

of Canada. An applicant must be under twenty-five, have completed at least one year in a Canadian university, and have obtained at least Second Class standing in the work of the session previous to the exchange year. The successful candidate does not pay fees to the exchange university. Applications may be obtained from the Registrar's Office, and are to be returned to the Registrar not later than January 15th.

LECTURESHIPS AND SPECIAL FUNDS

The Ben Hill-Tout Memorial Fund—This fund has been established as a memorial to Benjamin William Hill-Tout, who, from 1949 to 1954, served as staff photographer in the audio-visual services of this University. In founding this fund his friends, colleagues, and family desire to perpetuate the remembrance of a fine artist, a generous friend, and a man of exceptional courage and character. In furtherance of this aim, the annual income from the fund will be used to provide the Ben Hill-Tout Memorial Prizes, which will be awarded from time to time in competitive exhibitions of photographic art at the University.

The Canadian Arthritis and Rheumatism Society Lectureship—Through a grant from the Canadian Arthritis and Rheumatism Society, British Columbia Division, a fund for professional education has been established in the Faculty of Medicine. This fund makes provision for an annual lecture or post graduate course on the rheumatic diseases, the arrangements for which are made by the Faculty in consultation with the Department of Continuing Medicine and C.A.R.S.

Canadian Cancer Society, British Columbia Division, Lectureship—Through the generosity of the Canadian Cancer Society, B.C. and Yukon Division, a lectureship has been established in the Faculty of Medicine in the field of cancer work. The annual lecture provided by this contribution will be arranged to coincide with the Annual Meeting of the B.C. and Yukon Division of the Canadian Cancer Society.

The Ciba Lectureship—Through the generosity of Ciba Company Limited, a lectureship has been established on an annual basis to provide a distinguished speaker on some topic connected with medical education or research.

The Dr. J. W. Thomson Fund in Surgery—In memory of Dr. J. W. Thomson, a member of Convocation of this University and a pioneer surgeon of Vancouver who was greatly interested in surgical education and medical problems throughout a busy and productive career, this Fund has been established by his wife. The purpose of the Fund is to assist in surgical education and research, at the discretion of the Department of Surgery.

The Garnett Sedgewick Memorial Fund—The interest from this fund, established by friends of the late Garnett G. Sedgewick, Professor and Head in the Department of English from 1918 to 1948, will be used to provide special lectures in the University by speakers of scholarly distinction and broad sympathies; alternatively, to supply scholarship aid to exceptional students or to add books, pictures or music to the permanent cultural assets of the University.

The Guy Fowler Memorial Fund—This fund, established by his widow in memory of Guy Fowler, outstanding dairy cattle breeder of British Columbia, provides an income of \$1000 annually for research, scholarship and lecture-ship assistance to the Division of Animal Science in furtherance of its work in relation to the dairy cattle industry and animal breeding.

The Hewitt Bostock Lectureship—Through the generosity of the Misses Bostock, a lectureship has been established in honour of their father, the late Senator Hewitt Bostock, providing for a public lecture at least once in three years by a speaker of national or international reputation on a subject of educational or social importance.

The H. R. MacMillan Lectureship in Forestry—Through the generosity of H. R. MacMillan, C.B.E., D.Sc., LL.D., and the H. R. MacMillan Family Fund, a fund has been established to provide for the presentation and publication of lectures in forestry by outstanding figures in forestry or the forest industries. In addition, the lecturer is available for several days to speak to forestry students, to consult with members of the Faculty, and to address professional and other groups.

The Merck Sharp & Dohme Lectures—Through the generosity of Merck Sharpe and Dohme of Canada Limited, annual lectures have been established in the Faculty of Medicine in the field of medicine and allied sciences, including biochemistry, physiology, pathology, bacteriology and pharmacology.

The Simmons and McBride Lectureship—Through the generosity of Simmons & McBride Ltd., a lectureship has been established on an annual basis which will bring to the University a distinguished lecturer in some field of medical research.

APPOINTMENTS IN HER MAJESTY'S OVERSEAS CIVIL SERVICE AND OTHER APPOINTMENTS UNDER COLONIAL GOVERNMENTS

Vacancies exist from time to time in H.M. Overseas Civil Service (formerly the Colonial Service), and in various posts under British Colonial Governments. The Service comprises an administrative branch and various professional branches, including medical, engineering, legal, agricultural, forestry, veterinary, educational, survey, geological survey and nursing. Most appointments are made to the Governments of the African territories such as Kenya, Tanganyika, Northern Rhodesia, Uganda, Nyasaland and Aden; and occasionally to territories outside Africa such as Hong Kong, Borneo, Sarawak, Fiji, and the Caribbean Colonies.

Appointments are on a permanent and pensionable basis, subject to a satisfactory period of probation. In some branches, appointments may be made on a contract basis. Opportunities may arise for promotion to higher posts after some years service.

Further information may be obtained from the Liaison Officer for British Columbia, Dr. Harry V. Warren, Departments of Geology and Geography, University of British Columbia.