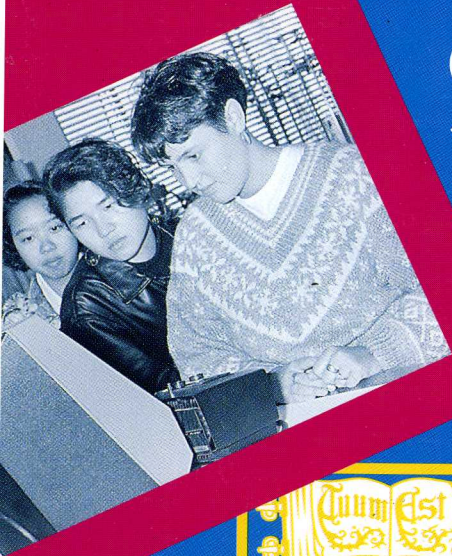


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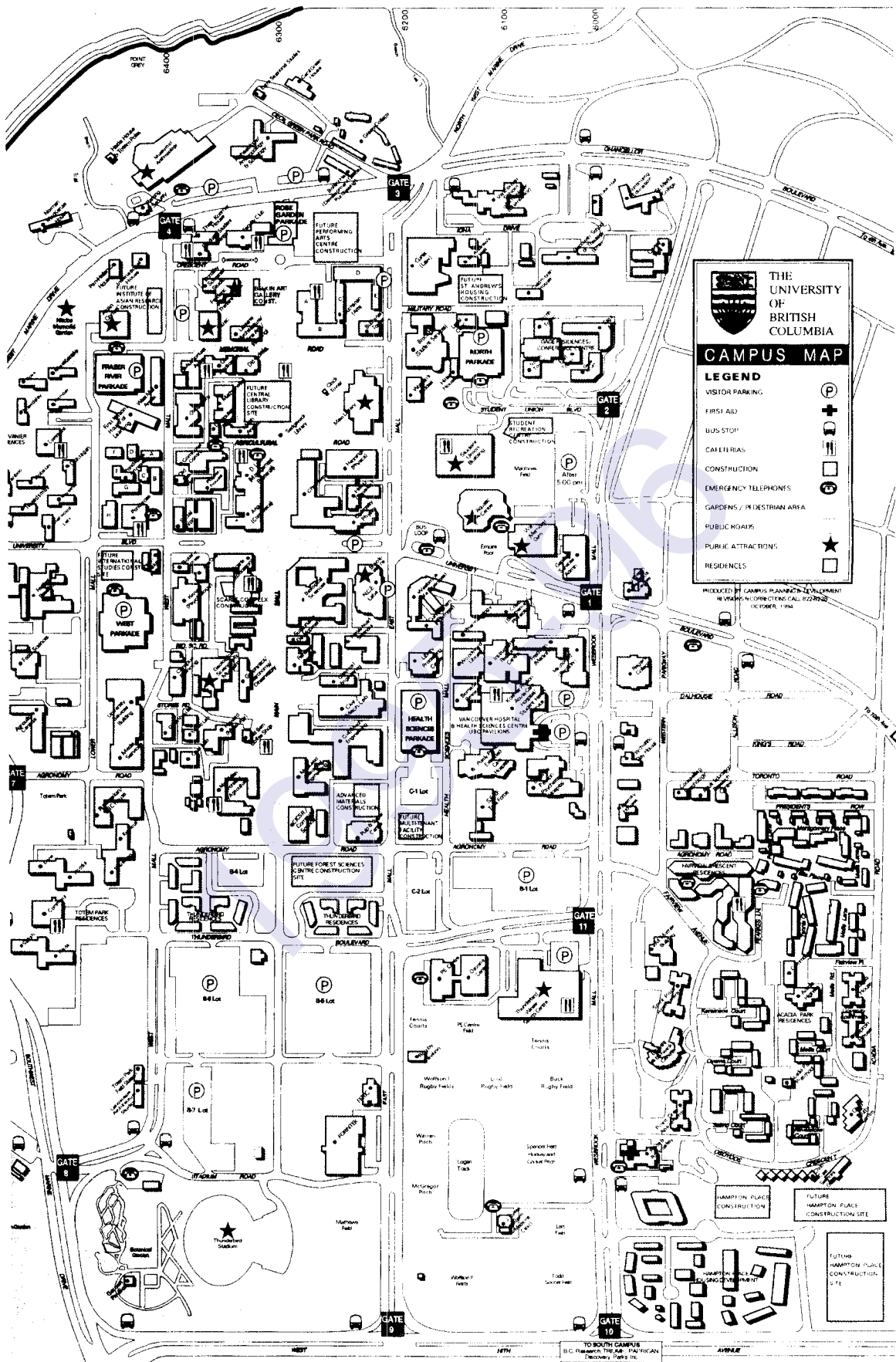
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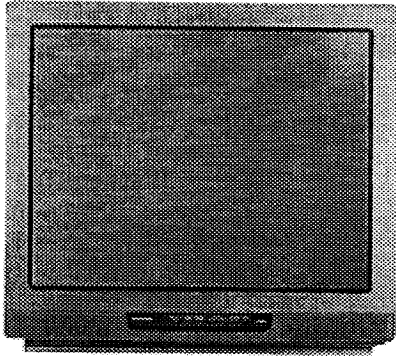
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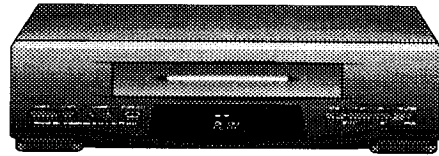
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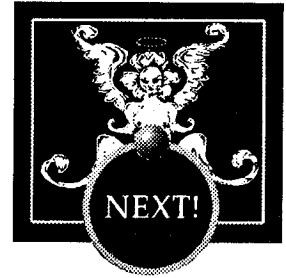
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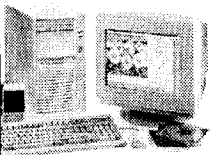
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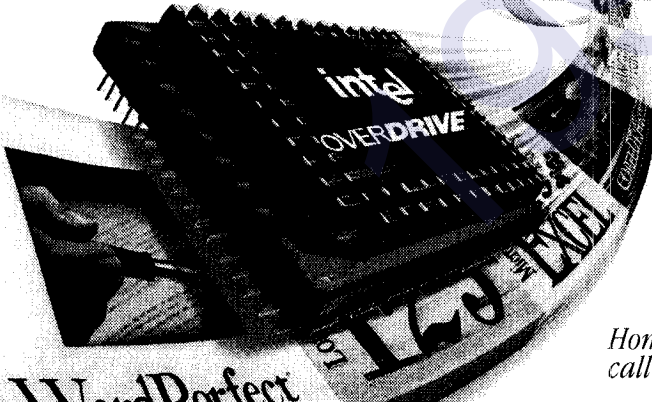
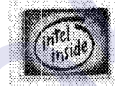
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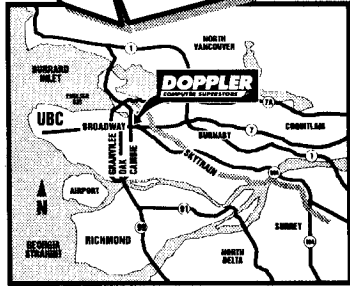
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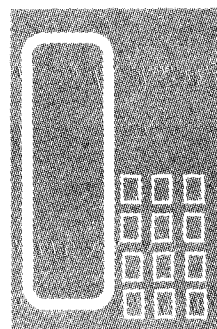
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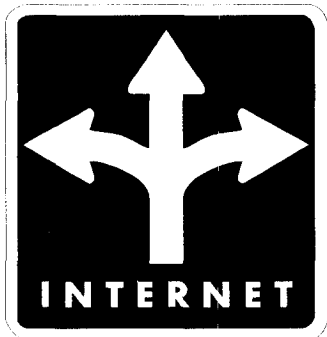
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1995/96 Application Dates

The following deadlines apply to new students and UBC students transferring from one program to another.

Applicants to those programs with deadlines falling on dates later than April 30 are advised to make application in advance of the published deadlines in order to take advantage of the early registration system (TELEREG).

Agricultural Sciences			
B.Sc. (Agr.) ¹	April	30	
Family and Nutritional Sciences			
B.H.E. ²	April	30	
B.Sc.(Dietet.) ³	April	30	
Landscape Architecture			
B.L.A. ²	April	30	
Applied Science			
Engineering			
B.A.Sc. - Including transfers from other programs and readmission: ²	April	30	
Nursing			
B.S.N. (four-year program) ⁴	April	30	
R.N's. for admission to third year	February	1	
Students returning after interrupted studies	February	1	
Arts			
B.A. ¹ - Including transfers from other programs	April	30	
Creative Writing B.F.A. ²	April	30	
Diploma in Applied Creative Non-Fiction ¹	June	30	
Diploma in Applied Linguistics ¹	June	30	
Diploma in Art History	July	31	
Diploma in Film Studies ²	March	31	
Diploma in French Translation	July	31	
B.A. (Film) ²	March	31	
Library, Archival, and Information Studies	February	1	
Music - B.Mus. ³	April	15	
Social Work - B.S.W. ¹	February	28	
Fine Arts			
B.F.A. Studio Program (Third Year) ²	March	31	
Second Year Studio Art Courses which are prerequisite to B.F.A. and B.A. Studio Arts programs			
Portfolio Deadline:	March	31	
Theatre			
B.F.A. (Acting) ²	March	31	
B.F.A. (Design/Technical Theatre) ¹	April	30	
Internal Departmental Deadlines			
For additional supplementary application forms:			
Economics Major	June	15	
English Honours	June	15	
General B.A.	May	15	
International Relations Major	May	15	
Political Science Major	May	15	
Theatre or Film Major	April	1	
Commerce and Business Administration			
B.Com. ¹	April	30	
Dentistry			
D.M.D. - Including application for readmission	December	15	
B.D.Sc.	April	15	
Education			
B.Ed. - Including transfers from other programs	April	15	
Application by March 15 is advisable. All documents except transcripts for work in progress are required by April 15. Transcripts showing completion of work in progress are required by June 15.			
Human Kinetics			
B.H.K. ² - Including transfers from other programs	April	30	
Diploma Programs			
Applications are accepted all year and should be received one month before anticipated registration date.			
Forestry			
B.S.F., B.Sc. (Forestry)	April	30	
B.Sc. (Natural Resource Conservation) ¹	April	30	
Graduate Studies			
For studies commencing September 1, 1995. Please check with department concerned in the event that earlier deadlines may apply.			
Overseas international applicants	March	31	
Canadian and U.S. applicants	April	30	
Law.			
LL.B.	February	1	
Application for readmission	May	31	
Medicine			
M.D. ²	December	15	
Rehabilitation Sciences (Second Year)¹			
B.Sc. (O.T.) and B.Sc. (P.T.)			
Including application for readmission:	February	28	
Medical Laboratory Science			
B.M.L.Sc. ²	April	30	
Pharmaceutical Sciences			
B.Sc. (Pharm.) ² - Including application for readmission and transfers from other programs	April	30	
Science			
B.Sc. ² - Including transfers from other programs:	April	30	
Diploma in Meteorology ¹	June	30	
Documentation Deadlines			
¹ May 31			
² June 15			
³ June 30			
⁴ July 15			
⁵ July 30			
Other Deadlines			
¹ Manuscript Deadline, April 30			
² Portfolio Deadline, March 31			
³ Audition Deadline, April 15			
⁴ Audition Deadline, April 1			

Special Application Deadlines

• Auditors	June 30
• Concurrent Studies	June 30
• Unclassified	June 30
• Visiting	June 30
• International Undergraduate Applications*	March 31

* unless earlier date indicated for particular program

Winter Session

Readmission **June 30**

Students returning to the University to the same program following an interruption of studies, and students whose mark statements for the previous Winter Session did not indicate eligibility to return, must submit an Application for Readmission by this date, unless an earlier deadline is specified above for a particular program. Applications for Readmission received after this date will be processed as time permits but may result in late registration.

Summer Session

Term 1 (Evening Courses)

International students	February 28
All other students	March 31

Term 2 (Day Courses)

International students	February 28
All other students	April 15

Guided Independent Study (UBC ACCESS)

For courses starting in:	Apply by:
September	August 1
November	October 2
January	December 1
March	February 1
May	April 1
July	June 3

August 1995

- 3 Thursday Deadline for completion of the Language Proficiency Index (LPI) Test by B.C. students intending to take a first-year English course in September.
- 7 Monday B.C. Day. University closed.
- 13 Sunday International Student Reception Program for newly arriving international students, August 13 to September 2 inclusive.
- 14 Monday Graduate Studies – last day for submission of doctoral theses to the Faculty of Graduate Studies for November graduation.
Last day for graduation applications to be submitted to the Registrar's Office by all students expecting to graduate in November.
- 16 Wednesday Deadline for completion of the LPI Test by out-of-province students intending to take a First-Year English course in September.
- 21 Monday Architecture – First-Year Workshop, August 21 to September 2 inclusive.
Dentistry, First-Year – orientation begins.
- 22 Tuesday Medicine, First-Year – registration.
- 23 Wednesday Fee deferrals – last day for early student loan recipients to submit applications for Winter Session fee deferral. Students who do not meet the deferral deadline will be required to

pay the first instalment of tuition fees by September 6 to avoid cancellation of registration.

- 23 Wednesday Last day for students who hold major external graduate or undergraduate fellowships to apply for Winter Session fee deferrals.
Last day for Teaching and Research Assistants to apply for payroll deduction of Winter Session tuition fees. Last day to submit application to have fees billed to a sponsoring organization. Students who do not submit their applications by the deadline will be required to pay the first instalment of tuition fees by September 6 to avoid cancellation of registration.
Dentistry, First Year – classes begin.
Medicine, First Year – classes begin.
- 26 Saturday Forestry Interior Field School for Third Year (FRST 351), August 27 to September 2 inclusive.
- 28 Monday Agricultural Sciences Field Trip (AGSC 300), August 28 to September 1 inclusive.
Dentistry, Second, Third and Fourth Years – Orientation.
Dentistry, Second Year – Medical classes begin.
Forestry Survey School (FOPR 263), August 28 to September 2 inclusive, plus three successive Saturdays during the term.

Academic Year 1995/96

The Academic Year begins on the first day of September and ends on the last day of August.

Winter Session

The Winter Session is divided into two terms: the first term, generally from early September to late December (although some studies begin in August) and the second term, generally from early January to the end of April (although some studies continue well into the month of May). During the Winter Session classes are offered in the evening as well as in the day. Enrolment is possible beginning in January to certain courses offered completely in the second term, subject to space availability.

Summer Session

Term 1 of Summer Session (former Spring Session) begins in early May and continues through July. In general, the courses are given during the evening.

Term 2 of Summer Session (former Summer Session) begins in early July and consists generally of six weeks of study.

Guided Independent Study

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- 28 Monday International Student Orientation, August 28 to September 1 inclusive, for new international students.
Medicine, Second and Third Years – registration and first day of classes.
Mining and Mineral Process Engineering Field Trip for Fourth Year (MMPE 492), August 28 to September 1 inclusive.
Pharm.D., First Year – classes begin
- 31 Thursday Dentistry, Third and Fourth Years – clinics and classes begin.

September 1995

- 1 Friday Academic year 1995/96 begins.
AMS New Student Retreat, September 1 to 3 inclusive.
- 4 Monday Labour Day. University closed. TELEREG unavailable.
- 5 Tuesday Classes begin for Winter Session day and evening courses for all faculties not already in session.
TELEREG available for Registration and course changes for Winter Session.
Guided Independent Study, Term A – course start date.
Law, First Year – Orientation begins.
Law, Second and Third Years – classes begin.
First day for application for assessment adjustment of Student Recreation Cen-

- 6 Wednesday Last day for payment of first instalment of fees for registration and course changes made before September 1. If an outstanding balance is not paid in full by this date, registration in all courses will be cancelled. Students may re-register by TELEREG subject to course availability.
Graduate Studies – last day for payment of September instalment of tuition fees. New students who have not paid their first instalment in full by this date will have their registration cancelled. Continuing students with outstanding balances will be placed on financial hold (see Fees section, item 5). Interest will be assessed on the outstanding balance until it is paid in full.
- 8 Friday Graduate Studies – last day for submission to most departments of Master's degree theses in final form for November graduation.
- 15 Friday Mini-Orientation for new International and Exchange Students.
- 19 Tuesday Guided Independent Study – TELEREG closes for courses starting in September.

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	ber. Last day for changes in registration and for withdrawal without a "W" standing recorded on transcript.	1 Sunday*	Faculty textbook adoptions required by Bookstore for courses beginning in January.				submitted and all requirements met for non-thesis Master's degrees to be awarded in November.
19 Tuesday	Last date for changes in registration and for withdrawal from most Term 1 courses without withdrawal standing of "W" recorded on transcript.	2 Monday	Guided Independent Study--TELEREG available for courses starting in November.	18 Wednesday	Meeting of the Senate.	31 Tuesday	Last day for submission of applications for supplemental and deferred Examinations from Summer Session.
20 Wednesday	Meeting of the Senate.	7 Saturday*	Last day for payment of fees for any fee assessments incurred between September 1 and September 30. Students who have not paid the minimum payment (see Fees section, item 4) will have their registration cancelled. Students who have paid the minimum payment and have not paid the balance of their fees will have their registration, release of grades, and related activity placed on financial hold, and interest will be assessed on the outstanding balance until it is paid in full.	November 1995			
22 Friday	Last date for changes in registration and for withdrawal from most two-term courses without withdrawal standing of "W" recorded on transcript. TELEREG remains open for fee information and for Term 2 registration. Last day for completion of Bachelor's degree program requirements for graduation in November.	9 Monday	Thanksgiving Day. University closed. TELEREG unavailable.	1 Wednesday	Guided Independent Study -- Term B course start date.	6 Monday	Rehabilitation Sciences, Fourth Year -- Clinical Fieldwork begins for Physical Therapy Students. (November 6 to December 1).
30 Saturday*	Graduate Studies -- last day for major papers for non-thesis Master's degrees to be approved and submitted to departmental or faculty graduate offices for students wishing to graduate in November.	13 Friday	Last date for withdrawal from most Term 1 courses with withdrawal standing of "W" recorded on transcript. 1995 Open House and Homecoming, October 13 to 15 inclusive.	10 Friday	Guided Independent Study--TELEREG closes for courses starting in November. Last day for changes in registration and for withdrawal without a "W" standing recorded on transcript.	11 Saturday	Remembrance Day. Service in War Memorial Gymnasium for all students, faculty, alumni, staff and friends, 10:45 am. TELEREG unavailable.
October 1995				15 Sunday*	Graduate Studies -- last day for submission to Library of Master's and Doctoral theses for graduation in November. Graduate Studies -- last day for departments to notify Faculty of Graduate Studies that major papers have been	13 Monday	University Closed in lieu of Remembrance Day. TELEREG unavailable.
1 Sunday*	General University Bursaries -- last day for applications to be submitted to the Awards Office. Work Study Program -- last day for applications to be submitted to the Awards Office.			15 Wednesday	Meeting of the Senate.	23 Thursday	Congregation ceremonies for conferring of degrees, War Memorial Gymnasium.

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- 24 Friday Last date for withdrawal from most two-term courses with withdrawal standing of "W" recorded on transcript.
- 30 Thursday Graduate Studies – last day for submission to the Faculty of Graduate Studies of Killam Memorial Postdoctoral Fellowship applications.

December 1995

- 1 Friday Guided Independent Study – TELEREG available for courses starting in January. Last day of classes for most faculties scheduling formal December Examinations. Dentistry, First Year – last day of Dental classes, Medical classes continue. Law, All years – last day of classes. Medicine, First Year – mid-term Examinations (December 1 to 8). Medicine, Second Year – last day of classes.
- 4 Monday Supplemental and Deferred Examinations, Summer Session only. Dentistry, First Year – examination period begins. Medicine, Second Year – study week (December 4 to 8). Graduate Studies – students wishing to apply for University Graduate Fellowships for 1995/96 should check with their department for internal deadlines.

- 5 Tuesday December Examinations begin for most faculties, day and evening classes. Law, All years – December Examinations begin.
- 6 Wednesday Dentistry, Second, Third and Fourth Years – last day of classes.
- 8 Friday Medicine, First Year – last day of classes.
- 11 Monday Medicine, Second Year – December Examinations (December 11 to 15). Dentistry, Second, Third and Fourth Years – Examinations (December 11 to 15).
- 13 Wednesday Meeting of the Senate.
- 15 Friday Medicine, Third and Fourth Years – last day of classes.
- 21 Thursday Last day of December Examinations for most faculties. Law, All years – last day of December Examinations.
- 24 Sunday TELEREG unavailable until Wednesday, December 27.
- 25 Monday Christmas Day, University closed.
- 26 Tuesday Boxing Day, University closed.
- 27 Wednesday TELEREG available for Term 2 registration and course changes, Guided Independent Study registration, and fee information.
- 29 Friday Deadline for application for deferment of tuition fee payment for Term 2 for new and returning students not regis-

tered in Term 1. This applies only to student loan recipients and students who hold major external graduate or undergraduate fellowships.

31 Sunday TELEREG unavailable until Tuesday, January 2.

January 1996

- 1 Monday New Year's Day, University closed.
- 2 Tuesday TELEREG available for Term 2 registration and course changes, Guided Independent Study registration, and fee information. Second term begins, Winter Session – all faculties, day and evening classes. Guided Independent Study – Term C course start date. Dentistry, First, Second, Third and Fourth Years – classes begin. Law, All years – classes begin. Medicine, First, Second, and Third Years – classes begin. Medicine, Fourth year – Clinical Rotations resume. Rehabilitation Sciences – Clinical Fieldwork begins:
 - Third-Year Physical Therapy students (January 2 to February 7).
 - Fourth-Year Occupational Therapy students (January 2 to April 12).

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5 Friday Mini-Orientation for new International and Exchange Students.

7 Sunday* Last day for payment of second instalment of fees for registration and course changes made on or before December 31. If an outstanding balance is not paid in full by this date, registration, release of grades, and related activity will be placed on financial hold and interest will be assessed on the outstanding balance until it is paid in full.

Registration will be cancelled in all courses for students registering in Term 2 only, if their fees are not paid in full by this date. Students may re-register through TELEREG subject to course availability.

Graduate Studies – last day for payment of January instalment of tuition fees. New students who have not paid their first instalment in full by this date will have their registration cancelled. Continuing students with outstanding balances will be placed on "Financial hold" (see Fees section, item 5). Interest will be assessed on the outstanding balance until it is paid in full.

Last day for application for tuition fee payment by payroll deductions for Winter Session Term 2 (January to April).

16 Tuesday Guided Independent Study – TELEREG closes for courses starting in January. Last day for changes in registration and

for withdrawal without "W" standing on transcript.

16 Tuesday Last date for changes in registration and for withdrawal from most Term 2 courses without withdrawal standing of "W" recorded on transcript. TELEREG remains open for fee information.

17 Wednesday Meeting of the Senate.

31 Wednesday Exchange Programs – Last day for applications to be submitted to the Student Exchange Office for the Education Abroad Programs and the Canadian Exchange Programs.

February 1996

1 Thursday Faculty textbook adoptions required by Bookstore for courses beginning in May.

Graduate Studies – last day for departments to submit nominations for University Graduate Fellowships on behalf of students.

Guided Independent Study – TELEREG available for courses starting in March.

7 Wednesday Last day for payment of fees for any fee assessments incurred between January 1 and 31. Students who have paid the minimum payment and have not paid the balance of their fees will have their registration, release of grades, and related activity placed on financial hold, and interest will be assessed on the

outstanding balance until it is paid in full.

9 Friday Last date for withdrawal from most Term 2 courses with withdrawal standing of "W" recorded on transcript.

12 Monday Rehabilitation Sciences – Fourth-Year Physical Therapy students, Mid-Term Break (February 12 to 16).

14 Wednesday Meeting of the Senate.

15 Thursday Last day for Graduation Applications to be submitted to the Registrar's Office by all students expecting to graduate in May.

19 Monday Mid-term break most faculties, February 19 to 23. Lectures and laboratories cancelled. Library and other facilities open.

Law – Reading Week, lectures cancelled February 19 to 23.

Rehabilitation Sciences – Fourth-Year Physical Therapy Students, Final Clinical Fieldwork begins. (February 19 to April 12).

March 1996

1 Friday Faculty textbook adoptions required by Bookstore for courses beginning in July.

Graduate Studies – last day for submission of doctoral theses to the Faculty of Graduate Studies for Spring graduation.

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Dentistry – First Year, last day of classes, end of Phase I.

1 Friday Medicine – First Year, end of Phase I.

1 Monday Dentistry and Medicine, First Year – study period (March 4 to 6).
Guided Independent Study, Term D – course start date.

7 Thursday Dentistry and Medicine – First Year Examinations (March 7 to 15).

8 Friday Guided Independent Study – TELEREG closes for courses starting in March. Last day for changes in registration and for withdrawal without “W” standing recorded on transcript.

15 Friday B.C. Student Assistance Program (BCSAP) – last day for applications and appeals for 1995/96 Winter Session. (Subject to change.)
Guided Independent Study – TELEREG available for courses starting in May.
Summer Session – TELEREG available for registration for all courses. Most courses run:

- Term 1 (Evening courses), May 6 to July 26;
- Term 2 (Daytime courses), July 2 to August 10 or 16.

18 Monday Dentistry and Medicine, First Year – Vacation week (March 18 to 22).

20 Wednesday Meeting of the Senate.

22 Friday Medicine, Third Year – last day of classes.

23 Saturday Medicine, Third Year – Examination Week (March 23 to 28).

25 Monday Medicine, First Year – beginning of Phase II.
Dentistry, First Year – beginning of Phase II.

28 Thursday Faculty Association Annual Meeting, 1:00 pm.

29 Friday Graduate Studies – last day for submission to most departments of Master’s degree theses in final form for Spring graduation.
Last day for submission of graduating essays and theses, most Bachelor degree programs.
Faculty textbook adoptions required by Bookstore for courses beginning in September.
Dentistry, Third and Fourth Year – last day of clinics and classes.
Law, All years – last day of classes.
Medicine, Second Year – last day of classes second term. Phase I.
Graduate Studies – last day for major papers for non-thesis Master’s degrees to be approved and submitted to departmental or faculty graduate offices for Spring graduation.

April 1996

1 Monday Medicine, Second Year – Examination Week (April 1 to 5).
Medicine, Third Year – Elective Block commences (April 1 to 26).

2 Tuesday Dentistry, Third and Fourth Year – Examinations begin.
Law, All years – examinations begin.

4 Thursday Last day of classes for most faculties.

5 Friday Good Friday. University closed. TELEREG unavailable until Tuesday, April 9.

8 Monday Easter Monday. University closed. TELEREG unavailable.

9 Tuesday April Examinations begin (day and evening classes), most faculties.
Medicine, Second Year, Second Term – classes recommence.

12 Friday Dentistry, Second Year – last day of Medical classes.

15 Monday Deadline for application for entrance scholarships for students enrolling at UBC from Grade 12.
Deadline for application for deferment of tuition fee payment for Summer Session Term 1.
Rehabilitation Sciences – Final course begins for Fourth-Year Occupational Therapy students.

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17 Wednesday Meeting of the Senate.

20 Saturday Geography -- Third-Year students begin Field School (GEOG 309).

21 Sunday Forestry -- Third-Year students begin 18-day Field Work at the University Research Forest, Maple Ridge, B.C. (FRST 151).

22 Monday Dentistry, Second Year -- Examinations begin.

Rehabilitation Sciences, Third-Year -- Clinical Fieldwork begins for Occupational Therapy students.

25 Thursday April Examinations end for most faculties.

26 Friday Civil Engineering Surveying Field School begins (CIVL 235).

Graduate Studies -- last day for submission to Library of all Master's and Doctoral theses for Spring graduation.

Graduate Studies -- last day for departments to notify the Faculty of Graduate Studies that major papers have been submitted and all requirements met for non-thesis Master's degrees for Spring graduation.

Graduate Studies -- last day for departments to submit applications for University Graduate Fellowships in Late Competition on behalf of students not currently registered at UBC.

Law, All years -- last day of examinations.

26 Friday Medicine, Third Year -- last day of classes.

27 Saturday Geological Sciences -- Second Year students begin Field School (GEOL 235).

Geological Sciences -- Third Year students begin Field School (GEOL 335).

30 Tuesday Rehabilitation Sciences -- Last day of classes for Fourth-Year Occupational Therapy students.

Winter Session Ends

May 1996

1 Wednesday Graduate Studies -- last day for departments to submit nominations for University Graduate Fellowships on behalf of students open to incoming students only.

3 Friday Medicine, First and Fourth Years -- last day of classes.

Dentistry, First Year -- last day of medical classes.

6 Monday Summer Session, Term I -- first day of classes. Most Term I courses run from May 6 to June 1; and/or June 17 to July 2; or May 6 to July 26.

Summer Session -- TELEREG available for registration and course changes.

Summer Session -- Last day for Teaching and Research Assistants to apply for payroll deduction of Summer Session

6 Monday Guided Independent Study, Term A -- course start date.

Dentistry, First Year -- Final Examinations for medical classes (May 6 to 10).

Dentistry, Second Year -- preclinical session starts (May 6 to 31).

Medicine, First Year -- Final Examinations (May 6 to 10).

Rehabilitation Sciences -- Clinical Fieldwork begins for Second- and Third-Year Physical Therapy students, and Second-Year Occupational Therapy students.

7 Tuesday Graduate Studies -- last day for payment of May instalment of tuition fees.

Summer Session, Term I -- Tuition fees due.

10 Friday Guided Independent Study -- TELEREG closes for courses starting in May. Last day for changes in registration and for withdrawal without "W" standing recorded on transcript.

Medicine, Second Year -- last day of classes.

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- 11 Saturday Medicine, Second Year – OSCE Examination (May 11 to 12)
- 13 Monday Medicine, Second Year – Study Week (May 13 to 16).
Medicine, Fourth Year – 1996/97 session begins (May 13, 1996 to May 2, 1997). M.S.I. inter-departmental course begins (May 13 to 17).
- 15 Wednesday Meeting of the Senate.
Affiliation Scholarships – last day for applications to be submitted to the Awards Office.
General and Entrance Scholarships – last day for applications to be submitted to the Awards Office by students entering UBC from other post-secondary institutions, or returning to UBC after a year or more of absence.
- 17 Friday Medicine, Second Year – Examination Week (May 17 to 21).
- 20 Monday Victoria Day. University closed. TELEREG unavailable.
Medicine, Fourth Year – 1996/97 Clinical Rotations begin.
- 23 Thursday Dentistry, First and Second Years – last day of classes.
- 27 Monday Baccalaureate concert, 8:00 pm.
Dentistry, First Year – Final Examinations (May 27 to 31).
- 28 Tuesday Congregation ceremonies for conferring of degrees, War Memorial Gymnasium.

- 29 Wednesday Congregation ceremonies for conferring of degrees, War Memorial Gymnasium.
- 30 Thursday Congregation ceremonies for conferring of degrees, War Memorial Gymnasium.
- 31 Friday Congregation ceremonies for conferring of degrees, War Memorial Gymnasium.
Graduate Studies – last day for Faculty of Graduate Studies to receive recommendations from departments for overseas international students to be admitted in September.

June 1996

- 1 Saturday Guided Independent Study – TELEREG available for courses starting in July.
TELEREG available for Winter Session Registration. Students should refer to their admission letter/statement of grades for their TELEREG access date.
- 14 Friday Summer Session, some Term 1 courses end.
- 15 Saturday* Deadline for application for deferment of tuition fee payment for Summer Session, Term 2. This applies only to student loan recipients and students who hold major external graduate or undergraduate fellowships.
Summer Sessions, Terms 1 and 2 – last day for submission of applications for Scholarships and Bursaries.

- 17 Monday Summer Session, Terms 1 and 2 – last day for B.C. Student Assistance Program applications for 1996. (Subject to change.)
- 21 Friday Last day for submission of applications for supplemental and deferred Examinations from previous Winter Session.
- 28 Friday Last day for “early” submission of applications for B.C. Student Assistance Program (BCSAP) (B.C. and Canada Student Loans) for 1996/97 Winter Session. Students applying after this date may not receive funds by the commencement of the term and may be disqualified for deferments and emergency loans.
- 28 Friday Graduate Studies – last day for Faculty of Graduate Studies to receive files from departments on North American students accepted for registration in September.
Affiliation Bursaries – last day for applications to be submitted to Awards Office.

July 1996

- 1 Monday Canada Day. University closed. TELEREG unavailable until Tuesday, July 2.
- 2 Tuesday Summer Session, Term 2 – TELEREG available for registration and course changes.



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- 2 Tuesday Guided Independent Study, Term B – course start date.
Summer Session, Term 2 – classes begin most courses. Term 2 courses run July 2 to 19; and/or July 22 to August 10; or July 2 to August 10. Some courses run until August 16.
- 7 Sunday* Summer Session, Term 2 – Tuition due date.
- 12 Friday Guided Independent Study – TELEREG closes for courses starting in July. Last day for changes in registration and for withdrawal without “W” standing recorded on transcript.
- 19 Friday Summer Session evening credit courses, lectures and examinations completed in all courses ending July 19.
Medicine and Dentistry – Supplemental Examinations (July 19 to 26).
- 20 Saturday Summer Session Examinations for courses ending July 19.
- 29 Monday Supplemental and Deferred examination period (Winter Session). Weekdays, July 29 to August 2

August 1996

- 1 Thursday Deadline for completion of the Language Proficiency Index (LPI) Test by B.C. students intending to take a First-Year English course in September.
- 5 Monday B.C. Day. University closed. TELEREG unavailable.
- 9 Friday Summer Session, Term 2 classes end, most courses.
- 10 Saturday Summer Session, examinations for courses ending August 9.
- 15 Thursday Graduate Studies – last day for submission of doctoral theses to the Faculty of Graduate Studies for November graduation.

Deadline for completion of the LPI Test by out-of-province students intending to take a first-year English course in September.

Summer Session, Term 2 classes end for seven-week courses.

Last day for graduation applications to be submitted to the Registrar’s Office by all students expecting to graduate in November.
- 16 Friday Summer Session, Term 2 Examinations for courses ending August 15.
- 19 Monday Orientation for International Students, August 19 to 23 inclusive.
- 21 Wednesday Last day for students who hold major external graduate or undergraduate fellowships to apply for Winter Session fee deferments.

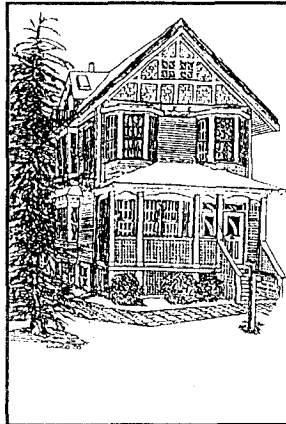
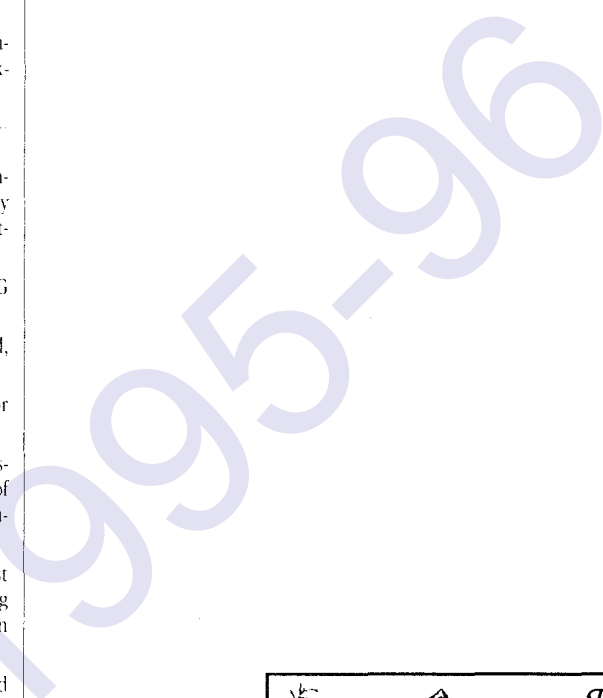
Students who do not meet the deferment deadline will be required to pay the first instalment of tuition fees by September 4 to avoid cancellation.

Last day for Teaching and Research Assistants to apply for payroll deduction.

tion of winter session tuition fees. Last day to submit application to have fees billed to a sponsoring organization. Students who do not submit their applications by the deadline will be required to pay the first instalment of tuition fees by September 4 to avoid cancellation of registration.

- 24 Saturday Forestry Interior Field School for Third Year (FRST 351), August 24 to 30 inclusive.
- 26 Monday Agricultural Sciences Field Trip (AGSC 300), August 26 to 31 inclusive.
Forestry Survey School (FOPR 263), August 26 to 31 inclusive, plus three successive Saturdays during term.

31 Saturday Academic Year Ends



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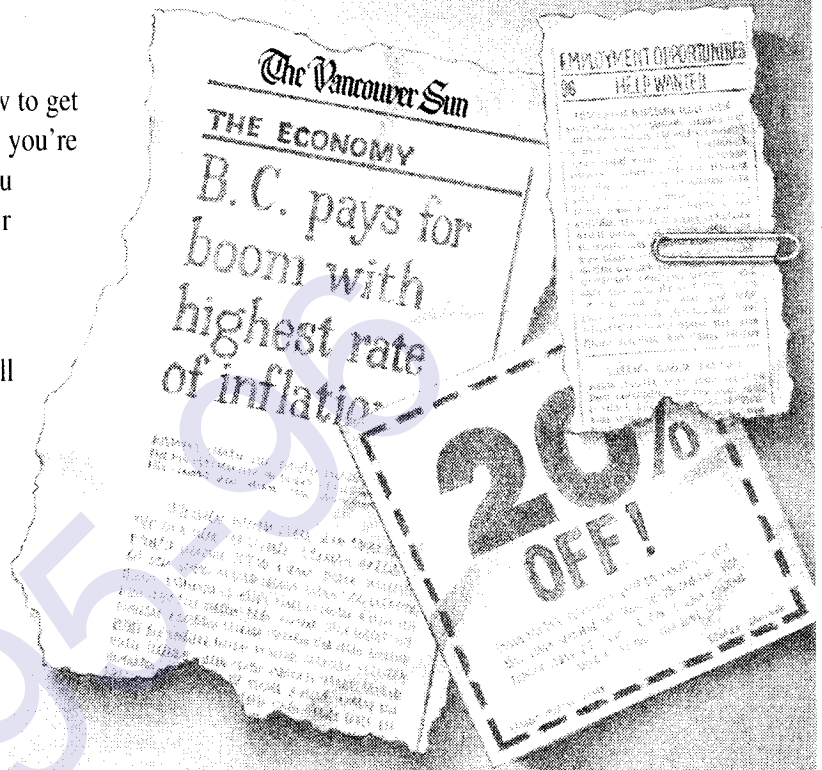
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I. ADAMOVICH, Professor Emeritus of Forestry (1984)
H. ADASKIN, Professor Emeritus of Music (1967)
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K. AMAGHER, Associate Professor Emerita of Social Work (1994)
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C. T. ANDERSON, Associate Professor Emeritus of Mathematics (1987)
T. W. ANDERSON, Professor Emeritus of Health Care and Epidemiology (1992)
J. D. ANDERSON, Professor Emeritus of Medical Microbiology (1995)
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N. ARMSTRONG, Associate Professor Emerita of Education (1984)
L. F. ASHLEY, Associate Professor Emeritus of Education (1982)
P. G. ASHMORE, Clinical Professor Emeritus of Surgery (1994)
N. M. ASHWORTH, Professor Emerita of Language Education (1988)
S. AUERSPERG, Professor Emerita of Anatomy (1994)
I. AVAKUMOVIC, Professor Emeritus of History (1992)
G. A. BADGER, Clinical Associate Professor of Surgery (1987)
D. A. BAIN, Associate Professor Emeritus of Educational Psychology and Special Education (1990)
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J. A. BALFOUR, Clinical Professor Emeritus of Surgery (1978)
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R. J. BANDONI, Professor Emeritus of Botany (1992)
D. BANKSON, Professor Emeritus of Creative Writing (1985)
L. BARCLAY, Associate Professor Emeritus of Education (1976)
J. BARNARD, Professor Emeritus of Physics (1994)
R. BARRIE, Professor Emeritus of Physics (1993)
V. BASCO, Clinical Professor Emerita of Surgery (1991)
S. BASCO, Professor Emeritus of Chemistry (1991)
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K. BEAMISH, Professor Emerita of Botany (1977)
I. BEATTIE, Associate Professor Emeritus of Mathematics and Science Education (1993)
M. P. BEDDOES, Professor Emeritus of Electrical Engineering (1989)
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C. S. BELSHAW, Professor Emeritus of Anthropology and Sociology (1987)
K. BENSON, Clinical Associate Professor Emeritus of Health Care and Epidemiology (1988)
J. C. BERRY, Professor Emeritus of Animal Science (1976)
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L. M. BEWLEY, Professor Emerita of Library, Archival and Information Studies (1992)
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J. E. BISMANS, Professor Emeritus of Medical Microbiology (1977)
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- I. DEHNEL, Senior Instructor Emerita of English (1991)
- R. E. DELAVAILL, Associate Professor Emeritus of Geological Sciences (1973)
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- D. DERRY, Professor Emeritus of Mathematics (1974)
- L. DESOBRINO, Professor Emeritus of Physics (1995)
- J. DICK, Clinical Associate Professor Emeritus of Medicine (1987)
- N. J. DIVINSKY, Professor Emeritus of Mathematics (1991)
- J. R. DOHENY, Assistant Professor Emeritus of English (1993)
- W. DOLL, Clinical Associate Professor Emeritus of Anaesthesia (1993)
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- K. R. DONNELLY, Associate Professor Emeritus of Anatomy (1994)
- P. J. DOOLING, Associate Professor emeritus of Forest Resources Management (1995)
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- P. DOW, Professor Emeritus of Oral Medical and Surgical Sciences (1988)
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- S. DRANCE, Professor Emeritus of Ophthalmology (1990)
- J. P. DUNCAN, Professor Emeritus of Mechanical Engineering (1985)
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- H. G. DUNN, Professor Emeritus of Paediatrics (1982)
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- G. H. DURRANT, Professor Emeritus of English (1981)
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- R. A. ENGLISH, Clinical Associate Professor Emeritus of Pathology (1994)
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- I. K. FOX, Professor Emeritus of Community and Regional Planning (1982)
- G. H. FRANCIS, Clinical Associate Professor Emeritus of Surgery (1978)
- H. FRANKLYN, Assistant Professor Emerita of French (1994)
- L. B. FRATKIN, Clinical Associate Professor Emeritus of Surgery (1986)
- W. E. FREDEMAN, Professor Emeritus of English (1991)
- C. L. FRIEDMAN, Associate Professor Emerita of Anatomy (1986)
- S. M. FRIEDMAN, Professor Emeritus of Anatomy (1985)
- C. T. FRIZ, Professor Emeritus of Anatomy (1993)
- D. C. FROST, Professor Emeritus of Chemistry (1989)
- A. M. FURNESS, Associate Professor Emerita of Social Work (1988)
- M. FURSTENWALD, Associate Professor Emerita of Germanic Studies (1985)
- M. H. FUTRELL, Professor Emeritus of Slavonic Studies (1990)
- F. E. GAMBLE, Professor Emeritus of Education (1983)
- F. D. GARRETT, Professor Emeritus of Anatomy (1977)
- E. GAUTSCHI, Senior Instructor Emeritus of Physical Education and Recreation (1984)
- G. GAYMAN, Clinical Associate Professor Emeritus of Paediatrics (1980)
- H. M. GEMEROY, Professor Emerita of Nursing (1977)
- A. GEREN, Clinical Professor Emeritus of Surgery (1994)
- D. C. GIBBARD, Professor Emeritus of Education (1978)
- W. C. GIBSON, Professor Emeritus of History of Medicine and Science (1978)
- W. H. GILBERT, Associate Professor Emeritus of Fine Arts (1986)
- D. C. GILLESPIE, Associate Professor Emeritus of Mathematics and Science Education (1992)
- P. C. GILMORE, Professor Emeritus of Computer Science (1990)
- F. P. GLICK, Associate Professor Emeritus of Health Care and Epidemiology (1992)
- G. GOERTZEN, Clinical Associate Professor Emeritus of Family Practice (1993)
- G. GOERTZEN, Clinical Associate Professor Emeritus of Family Practice (1994)
- M. GOETZ-STANKIEWICZ, Professor Emerita of Germanic Studies (1992)
- P. GOFTON, Clinical Professor Emeritus of Medicine (1987)
- M. K. GOLDBERG, Professor Emeritus of English (1991)
- T. GOLDBERG, Professor Emeritus of Visual and Performing Arts (1987)
- A. M. GOODEVE, Assistant Professor Emeritus of Pharmaceutical Sciences (1986)
- G. B. GOODMAN, Clinical Professor Emeritus of Surgery (1991)
- H. G. GOODWIN, Assistant Professor Emeritus of Social Work (1991)
- G. GORELIK, Associate Professor Emeritus of Commerce and Business Administration (1991)
- W. GORESKY, Clinical Professor Emeritus of Psychiatry (1994)
- F. A. GORNALL, Associate Professor Emeritus of Mathematics and Science Education (1983)
- E. B. GOSE, Professor Emeritus of English (1991)
- C. E. GOULD, Clinical Associate Professor Emeritus of Medicine (1976)
- P. GOULDSTONE, Professor Emerita of Visual and Performing Arts in Education (1984)
- R. H. GOURLAY, Clinical Professor Emeritus of Surgery (1987)
- C. C. GOURLAY, Professor Emeritus of Commerce and Business Administration (1982)
- J. I. GOW, Assistant Professor Emerita of History (1989)
- D. C. GRAHAM, Assistant Professor Emeritus of Medicine (1980)
- K. GRAHAM, Professor Emeritus of Forestry (1977)
- H. B. GRAVES, Clinical Associate Professor Emeritus of Anaesthesiology (1983)
- P. GRAY, Lecturer Emerita of Education (1989)
- R. F. GRAY, Professor Emeritus of Mathematics and Science Education (1985)
- J. U. GRAY, Professor Emeritus of Visual and Performing Arts in Education (1992)
- F. M. GREENWOOD, Associate Professor Emeritus of History (1988)
- H. J. GREENWOOD, Professor Emeritus of Geological Sciences (1990)
- R. J. GREGG, Professor Emeritus of Linguistics (1978)
- B. L. GREINBERG, Associate Professor Emeritus of English (1993)
- B. G. GRIFFITHI, Professor Emeritus of Forestry (1967)
- G. M. GRIFFITHS, Professor Emeritus of Physics (1989)
- E. V. GRILL, Associate Professor Emeritus of Oceanography (1988)
- F. J. GROVER, Professor Emeritus of French (1985)
- S. GRZYBOWSKI, Professor Emeritus of Medicine (1985)
- D. T. GUEST, Associate Professor Emeritus of Social Work (1989)
- A. M. GUNN, Professor Emeritus of Social and Educational Studies (1985)
- P. G. HADDOCK, Professor Emeritus of Forestry (1978)
- H. J. HAHN, Assistant Professor Emeritus of Clinical Dental Sciences (1993)
- W. F. HALL, Professor Emeritus of English (1990)
- J. E. HALLIDAY, Professor Emeritus of Pharmaceutical Sciences (1977)
- F. R. HAMLIN, Professor Emeritus of French (1992)
- P. HANN, Professor Emeritus of Obstetrics and Gynaecology (1989)
- M. E. HARDMAN, Senior Instructor Emerita of English (1992)

- F. C. HARDWICK, Professor Emeritus of Education (1972)
 A. HARDYMENT, Clinical Professor Emeritus of Paediatrics (1980)
 R. HARLOW, Professor Emeritus of Creative Writing (1989)
 T. R. HARMON, Clinical Associate Professor Emeritus of Pathology (1979)
 P. HARNETTY, Professor Emeritus of Asian Studies (1992)
 L. G. HARRISON, Professor Emeritus of Chemistry (1994)
 B. HARRISON, Professor Emeritus of History (1974)
 R. C. HARRISON, Professor Emeritus of Surgery (1987)
 T. J. HARROP, Professor Emeritus of Clinical Dental Sciences (1989)
 W. J. HARTRICK, Professor Emeritus of Education (1984)
 H. B. HAWTHORN, Professor Emeritus of Anthropology and Sociology (1976)
 L. D. HAYWARD, Professor Emeritus of Chemistry (1984)
 S. HEALY, Associate Professor Emeritus of Visual and Performing Arts (1985)
 R. G. HERBERT, Professor Emeritus of Law (1985)
 A. HERSTEIN, Clinical Assistant Professor Emeritus of Obstetrics and Gynaecology (1989)
 V. O. HERTZMAN, Clinical Professor Emeritus of Medicine (1985)
 M. A. HILL, Associate Professor Emerita of Social Work (1986)
 R. H. HILL, Professor Emeritus of Paediatrics (1992)
 R. J. HILLS, Professor Emeritus of Administrative, Adult and Higher Education (1994)
 J. HINGSTON, Clinical Professor Emeritus of Paediatrics (1986)
 J. N. HLYNKA, Professor Emeritus of Pharmaceutical Sciences (1991)
 S. S. HOAR, Professor Emeritus of Zoology (1979)
 W. L. HOLLAND, Professor Emeritus of Asian Studies (1973)
 M. R. HOOD, Associate Professor Emerita of Rehabilitation Medicine (1979)
 P. HOOGWERF, Clinical Assistant Professor Emeritus of Family Practice (1994)
 R. F. HOOLEY, Professor Emeritus of Civil Engineering (1990)
 V. G. HOPWOOD, Associate Professor Emeritus of English (1984)
 G. M. HOUGHAM, Professor Emeritus of Social Work (1986)
 I. HOUSEGO, Professor Emeritus of Administrative, Adult and Higher Education (1994)
 B. HOWARD, Assistant Professor Emerita of Physics (1988)
 J. F. HOWES, Professor Emeritus of Asian Studies (1989)
 W. J. HUDSON, Associate Professor Emerita of Rehabilitation Medicine (1988)
 J. F. HULLCOOP, Professor Emeritus of English (1993)
 C. R. HULTBERG, Professor Emeritus of Music (1993)
 F. W. HURLBURT, Clinical Professor Emeritus of Medicine (1982)
 E. J. HYDE, Assistant Professor Emeritus of Preventive and Community Dentistry (1985)
 K. HYDE, Associate Professor Emerita of Nursing (1988)
 S. HIDA, Professor Emeritus of Religious Studies (1992)
 M. JACKSON, Assistant Professor Emerita of Zoology (1990)
 H. JACKSON, Associate Professor Emeritus of Philosophy (1994)
 H. E. JACOBSON, Associate Professor Emerita of Anthropology and Sociology (1992)
 L. G. JAHNKE, Professor Emeritus of Law (1987)
 A. JAKUBOVIC, Associate Professor Emeritus of Psychiatry (1989)
 D. G. JAMES, Professor Emeritus of Chemistry (1990)
 S. M. JAMIESON, Professor Emeritus of Economics (1979)
 L. C. JENKINS, Professor Emeritus of Anaesthesiology (1991)
 R. C. JOHNSON, Assistant Professor Emeritus of English (1993)
 A. M. JOHNSON, Clinical Professor Emeritus of Medicine (1982)
 F. R. JOHNSTONE, Professor Emeritus of Surgery (1984)
 D. P. JONES, Associate Professor Emeritus of Medicine (1985)
 R. G. JONES, Professor Emeritus of Social and Educational Studies (1991)
 R. M. JORDAN, Professor Emeritus of English (1989)
 F. A. KAEMPFER, Professor Emeritus of Physics (1986)
 R. KEELER, Professor Emeritus of Physiology (1992)
 D. C. KENDALL, Professor Emeritus of Educational Psychology and Special Education (1988)
 J. M. KENNEDY, Professor Emeritus of Computer Science (1993)
 R. B. KERR, Professor Emeritus of Medicine (1974)
 L. R. KIRSEY, Associate Professor Emeritus of Electrical Engineering (1980)
 S. L. KHANNA, Assistant Professor Emeritus of Clinical Dental Sciences (1989)
 M. M. KHARADLY, Professor Emeritus of Electrical Engineering (1992)
 V. J. KIRKNESS, Associate Professor Emerita of Administrative, Adult and Higher Education (1993)
 D. KIANG, Associate Professor Emeritus of History (1993)
 M. KIJMAN, Clinical Associate Professor Emeritus of Surgery (1990)
 C. KLJNE, Clinical Associate Professor Emeritus of Psychiatry (1983)
 H. KLONOFF, Professor Emeritus of Psychiatry (1990)
 J. KNOBLOCH, Clinical Associate Professor Emerita of Psychiatry (1991)
 F. KNOBLOCH, Professor Emeritus of Psychiatry (1982)
 G. KNOX, Professor Emeritus of Fine Arts (1987)
 H. C. KNU TSON, Professor Emeritus of French (1988)
 K. L. KOBBERVIG, Professor Emeritus of Hispanic and Italian Studies (1993)
 G. W. KORN, Clinical Professor Emeritus of Obstetrics and Gynaecology (1990)
 G. KOVACS, Clinical Assistant Professor Emeritus of Psychiatry (1990)
 L. KRAINTZ, Professor Emeritus of Oral Biology (1987)
 W. KRAYENHOFF, Associate Professor Emeritus of Mathematics and Science Education (1985)
 C. R. KRISHNAMURTI, Professor Emeritus of Animal Science (1991)
 H. KRIVEL, Clinical Professor Emeritus of Paediatrics (1986)
 R. E. KUCERA, Associate Professor Emeritus of Geological Sciences (1987)
 H. LAJMON, Clinical Associate Professor Emeritus of Surgery (1991)
 R. LAKOVSKI, Professor Emeritus of Psychology (1992)
 F. C. LANGDON, Professor Emeritus of Political Science (1984)
 W. S. LANNING, Associate Professor Emeritus of Education (1972)
 J. A. LAPONCE, Professor Emeritus of Political Science (1991)
 P. A. LARKIN, University Professor Emeritus (1990)
 D. P. LAVENDER, Professor Emeritus of Forest Science (1992)
 J. A. JAVIN, Professor Emeritus of English (1994)
 T. C. LAWRENCE, Assistant Professor Emeritus of History (1983)
 C. S. LEAR, Professor Emeritus of Clinical Dental Sciences (1990)
 R. J. LEDUC, Associate Professor Emeritus of Mathematics and Science Education (1987)
 M. LEE, Professor Emeritus of Family and Nutritional Sciences (1991)
 P. O. LEHMANN, Clinical Instructor Emeritus of Surgery (1978)
 K. M. LEIGHTON, Professor Emeritus of Anaesthesiology (1991)
 J. LEJJA, Professor Emeritus of Mining and Mineral Process Engineering (1983)
 R. C. LEWIS, Associate Professor Emeritus of Mathematics and Science Education (1986)
 C. LI, Professor Emerita of Asian Studies (1970)
 J. LIJEMEZS, Professor Emeritus of Chemical Engineering (1991)
 W.-C. LIN, Professor Emeritus of Chemistry (1980)
 Y. J. LIN, Professor Emeritus of Psychiatry (1986)
 D. A. LINDQUIST, Senior Instructor Emeritus of Physics (1988)
 C. C. LINDSEY, Professor Emeritus of Zoology (1988)
 F. LLOY, Professor Emeritus of Physiology (1993)
 H. LITHERLAND, Clinical Professor Emeritus of Surgery (1992)
 H. V. LIVEMORE, Professor Emeritus of Hispanic and Italian Studies (1981)
 A. F. LIVSEY, Senior Instructor Emerita of English (1981)
 D. LIVINGSTONE, Assistant Professor Emerita of Visual and Performing Arts in Education (1988)
 J. A. LOBAN, Professor Emeritus of Music (1992)
 R. R. LOFFMARK, Professor Emeritus of Commerce and Business Administration (1985)
 L. E. LOWE, Professor Emeritus of Soil Science (1994)
 D. LUDWIG, Professor Emeritus of Mathematics/Zoology (1994)
 J. LUND, Professor Emeritus of Metals and Materials Engineering (1993)
 H. S. MAAS, Professor Emeritus of Social Work (1984)
 D. MACAREE, Associate Professor Emeritus of English (1985)
 A. N. MACDONALD, Associate Professor Emeritus of History (1990)
 J. A. MACDONALD, Associate Professor Emeritus of Social Work (1991)
 J. A. MACDONALD, Professor Emeritus of Visual and Performing Arts in Education (1985)
 M. E. MACFARLANE, Associate Professor Emerita of Home Economics (1967)
 V. A. MACKAY, Associate Professor Emerita of Education (1979)
 A. R. MACKAY, Associate Professor Emeritus of French (1992)
 J. R. MACKAY, Professor Emeritus of Geography (1981)
 C. MACKENZIE, Clinical Assistant Professor Emeritus of Family Practice (1991)
 C. J. MACKENZIE, Professor Emeritus of Health Care and Epidemiology (1986)
 H. M. MACKENZIE, Associate Professor Emerita of Education (1973)
 R. MACLEAN, Clinical Professor Emeritus of Pediatrics (1994)
 S. MADDIN, Clinical Professor Emeritus of Medicine (1987)
 B. MADSEN, Professor Emeritus of Civil Engineering (1992)
 H. E. MAJLORY, Professor Emerita of Nursing (1967)
 K. C. MANN, Professor Emeritus of Physics (1981)
 M. A. MANZAJAOLU, Professor Emeritus of English (1989)
 J. C. MAO, Professor Emeritus of Commerce and Business Administration (1988)
 B. E. MARCH, Professor Emerita of Animal Science (1986)
 A. MARCUS, Associate Professor Emeritus of Psychiatry (1992)
 E. L. MARGETTS, Professor Emeritus of Psychiatry (1985)
 S. E. MARKS, Associate Professor Emeritus of Counselling Psychology (1993)
 A. J. MARRIAGE, Associate Professor Emeritus of Sociology (1990)
 R. H. MARSHALL, Clinical Associate Professor Emeritus of Surgery (1987)
 A. W. MARSHALL, Professor Emeritus of Statistics (1987)
 W. H. MATHEWS, Professor Emeritus of Geological Sciences (1984)
 E. J. MATTE, Associate Professor Emeritus of French (1993)
 R. V. MATTFESSICH, Professor Emeritus of Commerce and Business Administration (1988)
 P. R. McCLElland, Assistant Professor Emeritus of Social Work (1995)
 R. McCONNELL, Professor Emerita of Education (1981)
 J. A. McDONALD, Associate Professor Emeritus of Spanish (1974)
 K. E. McDONNELL, Clinical Professor Emeritus of Medicine (1990)
 T. B. McDONOUGH, Assistant Professor Emerita of Education (1981)
 C. A. McDOWELL, University Professor Emeritus of Chemistry (1984)
 J. McGEHAEN, Professor Emeritus of Education (1975)
 E. McGEER, Professor Emerita of Psychiatry (1989)
 P. L. McGEER, Professor Emeritus of Psychiatry (1992)
 D. E. McGREER, Professor Emeritus of Chemistry (1993)
 B. J. MCGREGOR, Assistant Professor Emerita of Rehabilitation Medicine (1986)
 H. W. MCINTOSH, Professor Emeritus of Medicine (1985)
 J. MCIVER, Clinical Professor Emeritus of Anatomy (1994)
 T. D. McKIE, Professor Emeritus of Educational Psychology and Special Education (1988)
 D. M. McLEAN, Professor Emeritus of Pathology (1991)
 H. McLENNAN, Professor Emeritus of Physiology (1990)
 G. H. McMORLAND, Clinical Professor Emeritus of Anaesthesiology (1991)
 F. E. McNAIR, Clinical Assistant Professor Emeritus of Psychiatry (1984)
 J. A. McNEELY, Associate Professor Emeritus of Germanic Studies (1987)
 C. McNYEN, Associate Professor Emerita of Social Work (1989)
 J. A. McRAE, Assistant Professor Emerita of Education (1974)
 K. C. McTAGGART, Professor Emeritus of Geological Sciences (1985)
 J. D. McWHANNEL, Assistant Professor Emeritus of Education (1981)
 M. MEISSNER, Professor Emeritus of Sociology (1993)
 T. K. MENON, Professor Emeritus of Geophysics and Astronomy (1995)
 R. F. MERRIAM, Assistant Professor Emeritus of Mathematics and Science Education (1987)
 W. E. MESSENGER, Associate Professor Emeritus of English (1988)
 D. MILBURN, Professor Emeritus of Social and Educational Studies (1991)
 J. E. MILES, Professor Emeritus of Psychiatry (1992)
 C. W. MILLER, Associate Professor Emeritus of English (1980)
 L. I. MILLER, Associate Professor Emeritus of Germanic Studies (1992)
 M. MILLER, Clinical Assistant Professor Emerita of Anaesthesiology (1995)
 S. MILLER, Clinical Professor Emeritus of Anatomy (1982)
 H. S. MILLER, Clinical Professor Emeritus of Orthopaedics (1991)
 R. S. MILNE, Professor Emeritus of Political Science (1984)
 J. H. MILSUM, Professor Emeritus of Health Care and Epidemiology (1991)
 F. MIRIADY, Clinical Professor Emeritus of Paediatrics (1988)
 J. R. MITCHELL, Associate Professor of Physical Education and Recreation (1987)
 C. L. MITCHELL, Professor Emeritus of Commerce and Business Administration (1980)
 V. F. MITCHELL, Professor Emeritus of Commerce and Business Administration (1988)
 H. MITCHELL, Professor Emeritus of History (1989)
 A. G. MITCHELL, Professor Emeritus of Pharmaceutical Sciences (1994)
 L. G. MITTEN, Professor Emeritus of Commerce and Business Administration (1986)
 V. J. MODI, Professor Emeritus of Mechanical Engineering (1995)
 J. MOGAN, Assistant Professor Emerita of Nursing (1990)
 J. G. MOHR, Assistant Professor Emeritus of Pharmaceutical Sciences (1988)
 P. J. MOLONEY, Associate Professor Emeritus of Surgery (1988)
 P. MONTGOMERY, Associate Professor Emerita of Educational Psychology and Special Education (1987)
 P. K. MOODY, Assistant Professor Emeritus of Physical Education (1989)
 P. MOORE, Clinical Associate Professor Emeritus of Paediatrics (1990)
 A. M. MOORE, Professor Emeritus of Economics (1984)
 A. D. MOORE, Professor Emeritus of Electrical Engineering (1988)
 M. M. MORREHART, Associate Professor Emerita of Fine Arts (1989)
 J. MORISON, Assistant Professor Emeritus of Family Practice (1988)
 R. B. MORRIS, Professor Emeritus of Music (1986)
 B. M. MORRISON, Professor Emeritus of Asian Studies (1991)
 E. MORRISON, Professor Emeritus of English (1970)
 F. A. MORRISON, Professor Emeritus of Pharmaceutical Sciences (1983)
 K. S. MORTON, Professor Emeritus of Orthopaedics (1990)
 M. MORTON, Senior Instructor Emeritus of English (1987)
 B. B. MOSCOVICH, Clinical Associate Professor Emeritus of Medicine (1977)
 B. N. MOYLS, Professor Emeritus of Mathematics (1984)
 M. MULLINGER, Associate Professor Emerita of Paediatrics (1987)
 W. J. MULLINS, Associate Professor Emeritus of Philosophy (1986)
 P. M. MULLINS, Associate Professor Emeritus of Physical Education and Recreation (1986)
 R. MURATORIO-POSSE, Senior Instructor Emeritus of Anthropology and Sociology (1989)
 D. C. MURDOCH, Professor Emeritus of Mathematics (1977)
 J. S. MURRAY, Associate Professor Emeritus of Visual and Performing Arts (1987)
 F. E. MURRAY, Professor Emeritus of Chemical Engineering (1984)
 A. B. MURRAY, Professor Emeritus of Paediatrics (1992)
 J. E. MURPHY, Clinical Associate Professor Emeritus of Surgery (1982)
 S. NAKAI, Professor Emeritus of Food Science (1992)
 S. D. NAJEVYKIN, Assistant Professor Emerita of Education (1987)
 S. W. NASH, Professor Emeritus of Mathematics (1981)
 N. D. NATHAN, Professor Emeritus of Civil Engineering (1991)
 J. W. NELL, Professor Emeritus of Plant Science (1981)
 R. D. NEMSER, Associate Professor Emerita of English (1990)
 P. M. NERLAND, Clinical Associate Professor Emeritus of Health Care and Epidemiology (1987)
 M. B. NEVISON, Professor Emerita of Education (1982)
 F. S. NEWBY, Assistant Professor Emeritus of English (1979)

- H. NICHOL, Associate Professor Emeritus of Psychiatry (1990)
 W. NICHOLLS, Professor Emeritus of Social Work (1986)
 D. J. NIEDERHAUER, Professor Emeritus of French (1987)
 H. NISKAIA, Associate Professor Emerita of Nursing (1995)
 J. E. NIXON, Clinical Associate Professor Emeritus of Anaesthesia (1988)
 R. A. NODWELL, Professor Emeritus of Physics (1984)
 H. C. NORDAN, Associate Professor Emeritus of Zoology (1988)
 J. M. NORRIS, Professor Emeritus of History of Medicine (1991)
 T. G. NORTHICOTE, Professor Emeritus of Forest Sciences (1992)
 S. M. OBERG, Professor Emeritus of Commerce and Business Administration (1988)
 H. P. OBERLANDER, Professor Emeritus of Community and Regional Planning (1988)
 G. ODDO-DE STEFANIS, Associate Professor Emerita of Hispanic and Italian Studies (1990)
 A. L. OGILVIE, Professor Emeritus of Oral Medicine (1986)
 A. H. OGHANIAN, Senior Instructor Emeritus of Slavonic Studies (1988)
 O. A. OLDRIDGE, Professor Emeritus of Educational Psychology and Special Education (1989)
 P. G. OLLEY, Assistant Professor Emeritus of Mathematics and Science Education (1990)
 W. OPECHOWSKI, Professor Emeritus of Physics (1985)
 M. A. ORMSBY, Professor Emerita of History (1974)
 R. F. OSBORNE, Professor Emeritus of Physical Education (1978)
 B. D. OWEN, Professor Emeritus of Animal Science (1991)
 N. L. PADDOCK, Professor Emeritus of Chemistry (1983)
 B. F. PAIGE, Clinical Professor Emeritus of Medicine (1987)
 J. PANTER, Assistant Professor Emeritus of French (1994)
 R. PARKINSON, Clinical Associate Professor Emeritus of Psychiatry (1988)
 G. V. PARKINSON, Professor Emeritus of Mechanical Engineering (1990)
 T. R. PARSONS, Professor Emeritus of Oceanography and Zoology (1995)
 B. PATE, Professor Emeritus of Medicine (1993)
 W. J. PATTERSON, Clinical Associate Professor Emeritus of Surgery (1991)
 F. P. PATTERSON, Professor Emeritus of Surgery (1981)
 J. L. PAVELICH, Senior Instructor Emerita of English (1987)
 R. H. PEARCE, Professor Emeritus of Pathology (1989)
 J. E. PECK, Professor Emeritus of Computer Science (1984)
 M. E. PENNEY, Professor Emerita of Physical Education (1975)
 G. PENNINGTON, Associate Professor Emeritus of Human Kinetics (1995)
 C. D. PENNOCK, Associate Professor Emeritus of Language Education (1987)
 S. A. PERKINS, Professor Emeritus of Education (1986)
 E. PETERS, Professor Emeritus of Metals and Materials Engineering (1991)
 R. J. PHILLIPS, Senior Instructor Emeritus of Physical Education and Recreation (1980)
 G. L. PICKARD, Professor Emeritus of Oceanography and Physics (1979)
 A. E. PILOTO, Associate Professor Emeritus of English (1984)
 H.-K. PILTZ, Professor Emeritus of Music (1989)
 D. PINCUS, Associate Professor Emerita of Fine Arts (1995)
 K. L. PINDER, Professor Emeritus of Chemical Engineering (1991)
 A. C. PINKERTON, Clinical Associate Professor Emeritus of Medicine (1991)
 P. PINKUS, Professor Emeritus of English (1981)
 G. E. PIRIE, Associate Professor Emeritus of Paediatrics (1993)
 A. B. PITERNICK, Professor Emerita of Library, Archival and Information Studies (1992)
 G. PITERNICK, Professor Emeritus of Librarianship (1983)
 J. PETERS, Clinical Associate Professor Emeritus of Paediatrics (1976)
 B. J. POLAND, Professor Emerita of Obstetrics and Gynaecology (1985)
 W. J. POLGLASE, Professor Emeritus of Biochemistry (1982)
 H. S. POLOWY, Assistant Professor Emerita of Educational Psychology and Special Education (1995)
 M. POMFRET, Assistant Professor Emerita of Physical Education and Recreation (1987)
 J. B. POMFRET, Associate Professor Emeritus of Physical Education and Recreation (1988)
 N. POPPE, Associate Professor Emeritus of Slavonic Studies (1992)
 G. B. PORTER, Professor Emeritus of Chemistry (1991)
 R. POTASHIN, Assistant Professor Emerita of Psychology (1987)
 R. POUTT, Assistant Professor Emeritus of Educational Psychology and Special Education (1989)
 W. D. POWRIE, Professor Emeritus of Food Science (1992)
 M. E. PRANG, Professor Emerita of History (1986)
 J. PRICE, Professor Emeritus of Medicine (1992)
 M. A. PRIMEAU, Associate Professor Emerita of French (1979)
 M. H. PRYCE, Professor Emeritus of Physics (1984)
 D. L. PUGH, Professor Emeritus of Physical Education and Recreation (1987)
 E. G. PULLEYBLANK, Professor Emeritus of Asian Studies (1988)
 H. M. PIRKIS, Associate Professor Emerita of French (1984)
 L. N. QUASTEL, Assistant Professor Emerita of Rehabilitation Medicine (1990)
 M. D. RAINEY, Assistant Professor Emeritus of Language Education (1989)
 H. K. RALSTON, Assistant Professor Emeritus of History (1987)
 M. V. RALSTON, Associate Professor Emerita of Language Education (1989)
 R. L. RAMSAY, Associate Professor Emeritus of Physical Education and Recreation (1989)
 E. N. RAND, Senior Instructor Emeritus of Philosophy (1993)
 H. RAIZLAFF, Assistant Professor Emeritus of Educational Psychology and Special Education (1991)
 P. READ CAMPBELL, Associate Professor Emerita of Education (1972)
 S. E. READ, Professor Emeritus of English (1966)
 P. M. REBECK, Clinical Associate Professor Emerita of Surgery (1994)
 I. REBRIN, Senior Instructor Emerita of Slavonic Studies (1992)
 R. REE, Professor Emeritus of Mathematics (1988)
 F. L. REED, Professor Emeritus of Forest Resources Management (1993)
 I. REID, Assistant Professor Emerita of Slavonic Studies (1991)
 C. REID, Professor Emeritus of Chemistry (1981)
 M. REITZIK, Associate Professor Emeritus of Oral, Medical and Surgical Sciences (1990)
 P. REMYANT, Professor Emeritus of Philosophy (1988)
 A. J. RENNEY, Professor Emeritus of Plant Science (1979)
 C. S. RENNIE, Clinical Associate Professor Emeritus of Medicine (1982)
 G. D. REUBART, Professor Emeritus of Music (1986)
 V. REVUTSKY, Associate Professor Emeritus of Slavonic Studies (1976)
 A. J. REYNERTSON, Professor Emerita of Theatre (1988)
 J. F. RICHARDS, Professor Emeritus of Biochemistry (1992)
 A. S. RICHARDSON, Professor Emeritus of Clinical Dental Science (1991)
 J. I. RICHARDSON, Assistant Professor Emeritus of Religious Studies (1982)
 W. O. RICHMOND, Professor Emeritus of Mechanical Engineering (1973)
 W. A. RICHTER, Professor Emeritus of Clinical Dental Sciences (1989)
 D. L. RIZER, Associate Professor Emerita of Education (1975)
 W. ROBINS, Professor Emeritus of English (1975)
 R. E. ROBINS, Clinical Professor Emeritus of Surgery (1991)
 R. E. ROBINSON, Associate Professor Emeritus of Philosophy (1993)
 C. E. ROBINSON, Clinical Professor Emeritus of Medicine (1983)
 H. S. ROBINSON, Clinical Professor Emeritus of Medicine (1984)
 C. L. ROBINSON, Clinical Professor Emeritus of Surgery (1986)
 J. L. ROBINSON, Professor Emeritus of Geography (1981)
 G. C. ROBINSON, Professor Emeritus of Paediatrics (1987)
 R. A. ROBINSON, Professor Emeritus of Anthropology and Sociology (1986)
 R. H. RODGERS, Professor Emeritus of Family and Nutritional Sciences (1991)
 A. ROGATNICK, Professor Emeritus of Architecture (1985)
 R. H. ROGERS, Clinical Associate Professor Emeritus of Family Practice (1991)
 M. W. ROSE, Assistant Professor Emeritus of Visual and Performing Arts in Education (1984)
 G. ROSENBLUTH, Professor Emeritus of Economics (1986)
 A. ROSENTHAL, Professor Emeritus of Chemistry (1979)
 J. E. ROSS, Clinical Associate Professor Emeritus of Obstetrics and Gynaecology (1982)
 I. S. ROSS, Professor Emeritus of English (1993)
 J. V. ROSS, Professor Emeritus of Geological Sciences (1995)
 S. ROTHSTEIN, Professor Emeritus of Library, Archival and Information Studies (1986)
 G. E. ROUSE, Professor Emeritus of Botany (1994)
 L. A. ROUSSEAU, Associate Professor Emeritus of Mathematics and Science Education (1987)
 R. J. ROWAN, Professor Emeritus of Philosophy (1987)
 C. A. ROWLES, Professor Emeritus of Soil Science (1980)
 R. H. ROYDHOUSE, Professor Emeritus of Oral Biology (1989)
 K. M. RUPPENTHAL, Professor Emeritus of Commerce and Business Administration (1983)
 R. D. RUSSELL, Professor Emeritus of Geophysics and Astronomy (1991)
 B. SAINT-JACQUES, Professor Emeritus of Linguistics (1990)
 C. S. SAMIS, Professor Emeritus of Metallurgy (1977)
 H. D. SANDERS, Associate Professor Emeritus of Pharmacology and Therapeutics (1991)
 T. SANJY, Clinical Professor Emeritus of Surgery (1994)
 A. G. SAVERY, Senior Instructor Emerita of English (1983)
 A. R. SAWYER, Professor Emeritus of Fine Arts (1984)
 R. F. SCAGEL, Professor Emeritus of Botany (1986)
 W. B. SCHOFIELD, Professor Emeritus of Botany (1993)
 B. SCHRODT, Associate Professor Emerita of Human Kinetics (1994)
 M. H. SCHULTZ, Clinical Instructor Emeritus of Anaesthesia (1988)
 W. E. SCHWABH, Associate Professor Emeritus of Education (1981)
 C. J. SCHWARZ, Associate Professor Emeritus of Psychiatry (1988)
 A. D. SCOTT, Professor Emeritus of Economics (1989)
 W. R. SEAL, Associate Professor Emeritus of Education (1979)
 S. SEGAL, Professor Emeritus of Paediatrics (1985)
 G. R. SELMAN, Associate Professor Emeritus of Administrative, Adult and Higher Education (1992)
 D. SHADBOULT, Professor Emeritus of Architecture (1990)
 M. SHAW, University Professor Emeritus (1989)
 H. SHOFI, Associate Professor Emerita of Nursing (1990)
 R. SHUMAN, Associate Professor Emeritus of Psychiatry (1988)
 B. SHUMAN, Clinical Associate Professor Emeritus of Paediatrics (1982)
 R. I. SIKORA, Professor Emeritus of Philosophy (1993)
 R. SIMPSON, Clinical Associate Professor Emeritus of Anaesthesiology (1987)
 N. R. SIMCLAIR, Associate Professor Emerita of Education (1981)
 M. SION, Professor Emeritus of Mathematics (1989)
 H. C. SLADE, Professor Emeritus of Family Practice (1984)
 W. F. SLAWSON, Professor Emeritus of Geophysics and Astronomy (1992)
 I. H. SJUND, Professor Emeritus of Music Education (1975)
 G. SLOBIN, Senior Instructor Emeritus of Pharmaceutical Sciences (1994)
 G. SMEDLEY, Professor Emeritus of Fine Arts (1992)
 J. E. SMITH, Associate Professor Emeritus of Mathematics (1971)
 J. SMITH, Clinical Associate Professor Emeritus of Health Care and Epidemiology (1994)
 D. C. SMITH, Professor Emeritus of Education (1975)
 R. N. SMITH, Professor Emeritus of Education (1979)
 G. A. SMITH, Professor Emeritus of Education (1983)
 J. H. SMITH, Professor Emeritus of Forest Resources Management (1990)
 J. M. SMITH, Senior Instructor Emeritus of Mathematics and Science Education (1987)
 G. SNYDER, Assistant Professor Emerita of Language Education (1993)
 L. SOBRINO, Professor Emeritus of Physics (1995)
 M. SOGA, Professor Emeritus of Asian Studies (1992)
 J. J. SOLECKI, Associate Professor Emeritus of Slavonic Studies (1984)
 D. E. SOULE, Professor Emeritus of Theatre (1984)
 H. M. SOUTHARD, Assistant Professor Emerita of Rehabilitation Medicine (1983)
 R. W. SPITZER, Clinical Professor Emeritus of Pathology (1986)
 R. B. SPLANE, Professor Emeritus of Social Work (1982)
 J. D. SPOUGE, Professor Emeritus of Oral Medicine (1985)
 J. K. STAGER, Professor Emeritus of Geography (1993)
 L. M. STALEY, Professor Emeritus of Bio-Resource Engineering (1988)
 W. J. STANKIEWICZ, Professor Emeritus of Political Science (1987)
 S. STANTON, Associate Professor Emerita of Nursing (1990)
 R. C. STEELE, Associate Professor Emeritus of Visual and Performing Arts in Education (1990)
 J. R. STEIN, Professor Emerita of Botany (1987)
 M. W. STEINBERG, Professor Emeritus of English (1983)
 D. G. STEPIEN, Professor Emeritus of English (1988)
 G. H. STEPHENSON, Clinical Associate Professor Emeritus of Psychiatry (1982)
 R. STEWART, Professor Emeritus of Chemistry (1989)
 W. D. STEWART, Professor Emeritus of Medicine (1990)
 H. F. STICH, Professor Emeritus of Zoology (1991)
 J. J. STOCK, Professor Emeritus of Microbiology (1985)
 K. STOCKHOLDER, Professor Emerita of English (1994)
 R. STOKES, Professor Emeritus of Librarianship (1981)
 K. G. STRASSMANN, Associate Professor Emeritus of Theatre (1991)
 M. M. STREET, Associate Professor Emerita of Nursing (1972)
 B. STUART-STUBBS, Professor Emeritus of Library, Archival and Information Studies (1992)
 G. T. STUBBS, Associate Professor Emeritus of Education (1981)
 E. G. SUMMERS, Professor Emeritus of Educational Psychology and Special Education (1992)
 S.-C. SUNG, Professor Emeritus of Psychiatry (1990)
 A. E. SWANSON, Associate Professor Emeritus of Oral Medical and Surgical Sciences (1992)
 C. A. SWANSON, Professor Emeritus of Mathematics (1995)
 D. SYEKLOCHA, Assistant Professor Emerita of Microbiology (1991)
 P. J. SYKES, Assistant Professor Emeritus of Physics (1984)
 B. SYLVESTER, Associate Professor Emeritus of English (1991)
 G. SZASZ, Professor Emeritus of Psychiatry (1995)
 W. F. SZETELA, Associate Professor Emeritus of Mathematics and Science Education (1991)
 O. SZIKLAI, Professor Emeritus of Forest Sciences (1990)
 M. TADYCH, Assistant Professor Emerita of Social Work (1986)
 W. TALLMAN, Associate Professor Emeritus of English (1987)
 D. E. TALNEY, Associate Professor Emeritus of Music (1994)
 J. M. TEASDALE, Associate Professor Emerita of Paediatrics (1990)
 E. TEGHTSOONIAN, Professor Emeritus of Metals and Materials Engineering (1988)
 G. M. TENER, Professor Emeritus of Biochemistry (1993)
 J. V. THIRGOOD, Professor Emeritus of Forest Resources Management (1989)
 I. A. THOMAS, Associate Professor Emeritus of Fine Arts (1980)
 J. P. THOMAS, Clinical Professor Emeritus of Pathology and Medicine (1987)
 H. L. THOMAS, Senior Instructor Emerita of English (1993)
 M. THOMPSON, Assistant Professor Emerita of Education (1973)
 W. J. THOMPSON, Clinical Professor Emeritus of Surgery (1983)
 A. R. THOMPSON, Professor Emeritus of Law (1990)
 G. THOMPSON, Professor Emeritus of Surgery (1992)
 J. E. THORNTON, Associate Professor Emeritus of Administrative, Adult and Higher Education (1995)
 S. C. THORSON, Associate Professor Emeritus of Medicine (1990)
 W. M. THURLBECK, Professor Emeritus of Pathology (1995)
 H. A. THURSTON, Associate Professor Emeritus of Mathematics (1987)
 C. A. TIERS, Professor Emeritus of Architecture (1990)
 A. D. TILLEY, Associate Professor Emerita of Human Kinetics (1994)
 E. C. TODD, Professor Emeritus of Law (1993)
 M. TOLMIE, Associate Professor Emeritus of History (1990)
 J. W. TOMLINSON, Associate Professor Emeritus of Commerce and Business Administration (1991)

- J. TONZETICH, Professor Emeritus of Oral Biology (1990)
 G. TOUGAS, Professor Emeritus of French (1984)
 G. H. TOWERS, Professor Emeritus of Botany (1991)
 P. M. TOWNSLEY, Professor Emeritus of Food Science (1991)
 G. C. TROWSDALE, Professor Emeritus of Visual and Performing Arts in Education (1988)
 F. A. TURNBULL, Clinical Associate Professor Emeritus of Surgery (1976)
 R. TURNER, Professor Emeritus of Anthropology and Sociology (1994)
 L. TYHURST, Associate Professor Emerita of Psychiatry (1985)
 J. S. TYHURST, Professor Emeritus of Psychiatry (1987)
 M. UPRICHARD, Professor Emerita of Nursing (1977)
 F. B. VEY, Assistant Professor Emerita of Education (1970)
 D. J. VINCE, Professor Emeritus of Paediatrics (1993)
 E. W. VOGT, Professor Emeritus of Physics (1995)
 R. VRBA, Associate Professor Emeritus of Pharmacology and Therapeutics (1990)
 J. A. WADA, Professor Emeritus of Psychiatry (1991)
 H. G. WADMAN, Clinical Professor Emeritus of Obstetrics and Gynaecology (1987)
 A. WALDIE, Clinical Associate Professor Emeritus of Family Practice (1987)
 D. E. WALKER, Senior Instructor Emerita of Fine Arts (1986)
 R. A. WALL, Associate Professor Emeritus of Pharmacology and Therapeutics (1995)
 A. W. WALLACE, Clinical Associate Professor Emeritus of Health Care and Epidemiology (1977)
 J. H. WALLIN, Professor Emeritus of Administrative, Adult and Higher Education (1990)
 G. WAJSH, Associate Professor Emeritus of Education (1979)
 G. C. WALSH, Clinical Associate Professor Emeritus of Medicine (1982)
 E. L. WALTERS, Associate Professor Emeritus of Educational Psychology and Special Education (1989)
 M. WALTERS, Clinical Professor Emeritus of Medicine (1987)
 J. WALTERS, Professor Emeritus of Forestry (1985)
 E. M. Warbink, Assistant Professor Emerita of Nursing (1994)
 H. V. WARREN, Professor Emeritus of Geological Sciences (1973)
 J. B. WARREN, Professor Emeritus of Physics (1980)
 T. WATANABE, Professor Emeritus of Geophysics and Astronomy (1993)
 E. L. WATSON, Professor Emeritus of Bio-Resource Engineering (1979)
 N. WATT, Associate Professor Emeritus of Physical Education (1992)
 D. J. WATTERSON, Clinical Professor Emeritus of Psychiatry (1982)
 N. WAXLER-MORRISON, Associate Professor Emerita of Social Work (1992)
 J. M. WEAKLAND, Associate Professor Emerita of Visual and Performing Arts (1987)
 S. A. WEESE, Assistant Professor Emeritus of Theatre (1989)
 C. F. WEIRLICH, Associate Professor Emeritus of Zoology (1992)
 F. WEINBERG, Professor Emeritus of Metallurgical Engineering (1990)
 E. M. WEISGARBER, Professor Emeritus of Music (1985)
 W. G. WELLINGTON, Professor Emeritus of Plant Science (1986)
 C. WESLEY TOPPING, Professor Emeritus of Sociology (1954)
 T. I. WESTERMARK, Associate Professor Emeritus of Language Education (1988)
 G. WESTGATE, Clinical Associate Professor Emeritus of Surgery (1992)
 R. B. WHITE, Assistant Professor Emeritus of Educational Psychology and Special Education (1987)
 G. K. WHITE, Associate Professor Emeritus of Mathematics (1992)
 R. L. WHITE, Professor Emerita of French (1989)
 I. M. WHITEHEAD, Associate Professor Emeritus of English (1988)
 D. M. WHITELAW, Professor Emeritus of Medicine (1978)
 F. H. WHITMAN, Associate Professor Emeritus of English (1994)
 R. L. WHITMAN, Clinical Associate Professor Emeritus of Psychiatry (1985)
 H. D. WHITTLE, Professor Emeritus of Physical Education and Recreation (1982)
 E. WICKBERG, Professor Emeritus of History (1992)
 B. WIESMAN, Professor Emeritus of Community and Regional Planning (1991)
 N. J. WILIMOWSKY, Professor Emeritus of Animal Resource Ecology (1991)
 L. R. WILLIAMS, Clinical Assistant Professor Emeritus of Surgery (1978)
 D. H. WILLIAMS, Professor Emeritus of Medicine (1974)
 M. D. WILLMAN, Professor Emerita of Nursing (1994)
 N. WILSON, Professor Emerita of Physiology (1992)
 J. W. WILSON, Professor Emeritus of Harvesting and Wood Science (1990)
 J. H. WINTER, Professor Emeritus of History (1991)
 C. C. WISNICKI, Assistant Professor Emerita of Architecture (1984)
 W. F. WOOD, Assistant Professor Emeritus of Commerce and Business Administration (1990)
 B. J. WOOD, Associate Professor Emerita of Radiology (1991)
 L. G. WOOD, Clinical Instructor Emeritus of Surgery (1978)
 W. S. WOOD, Professor Emeritus of Pathology (1992)
 G. WOODCOCK, Lecturer Emeritus (1977)
 L. L. WOOLF, Professor Emeritus of Psychiatry (1984)
 D. J. WORT, Professor Emeritus of Botany (1975)
 A. YANDLE, Administrative Librarian Emerita (1992)
 D. J. YEO, Professor Emeritus of Clinical Dental Sciences (1987)
 W. YEOMANS, Assistant Professor Emeritus of English (1990)
 N. J. YORKSTON, Professor Emeritus of Psychiatry (1991)
 M. N. YOUNG, Assistant Professor Emeritus of Theatre (1992)
 J. T. YOUNG, Professor Emeritus of Education (1973)
- I. YOUNG, Professor Emeritus of Electrical Engineering (1991)
 Y.-N. YU, Professor Emeritus of Electrical Engineering (1975)
 N. C. ZACHARIAS, Senior Instructor Emeritus of Pharmaceutical Sciences (1980)
 J. W. ZAIRADNIK, Professor Emeritus of Bio-Resource Engineering (1991)
 S. H. ZBARSKY, Professor Emeritus of Biochemistry (1985)
 J. ZILBER, Professor Emeritus of Creative Writing (1989)

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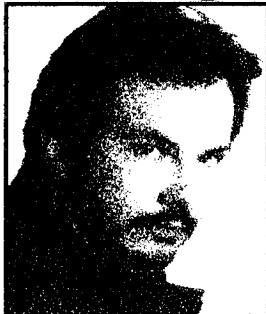
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The University Act

The *Universities Act* was rewritten in 1974 and has since been further revised. The University currently operates under the authority of the *University Act* of the Province of British Columbia (R.S.B.C. 1979, c119). Following are excerpts from the Act.

- “... the following . . . universities in the Province
- (a) “The University of British Columbia”;
 - (b) “University of Victoria”;
 - (c) “Simon Fraser University”.

“Each University shall be composed of a chancellor, a convocation, a board, a senate, and 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.”

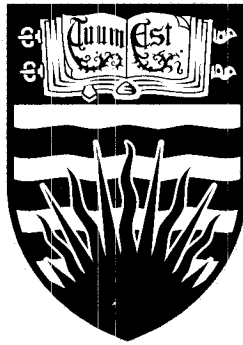
“The convocation of each university shall be composed of: the chancellor, who shall be chairman; the president; the members of the senate; all faculty members; all persons who are graduates of the university; and all persons whose names are added to the roll of the convocation by regulation of the senate. . . .”

“The board shall be composed of fifteen members as follows: (a) the chancellor; (b) the president; (c) two faculty members elected by the faculty members; (d) eight persons appointed by the Lieutenant-Governor in Council, two of whom shall be appointed from among persons nominated by the Alumni Association; (e) two students elected by and from the Student Association; (f) one person elected by and from the full-time employees of the university who are not faculty members.”

“The senate of each university shall be composed of: (a) the chancellor; (b) the president, who shall be chairman; (c) the academic vice-president or equivalent; (d) the deans of faculties; (e) the chief librarian; (f) the director of continuing education; (g) a number of faculty members equal to twice the number provided in clauses (a) to (f), to consist of two members of each faculty elected by the members of that faculty, and the remainder elected by all the faculty members in such manner as they, in joint meeting, determine; (h) a number of students, equal to the number provided in clauses (a) to (f), elected by and from the Student Association in a manner that ensures that at least one student from each faculty is elected; (i) four persons who are not faculty members, elected by and from the convocation; (j) four persons appointed by the Lieutenant-Governor in Council; (k) one member to be elected by the governing body of each affiliated college of the university; and (l) such additional members as the senate may from time to time determine without altering the ratio set out in clauses (g) and (h).”

“Each university shall, so far as and to the full extent which its resources from time to time permit. . . (a) establish and maintain colleges, schools, institutes, faculties, departments, chairs, and courses of instruction; (b) provide instruction in all branches of knowledge; (c) establish facilities for the pursuit of original research in all branches of knowledge; (d) establish fellowships, scholarships, exhibitions, bursaries, prizes, rewards, and pecuniary and other aids to facilitate or encourage proficiency in the subjects taught in the university and original research in all branches of knowledge; (e) provide a program of continuing education in all academic and cultural fields throughout the Province; and (f) generally promote and carry on the work of a university in all its branches, through the co-operative effort of the board, senate, and other constituent parts of the university.”

“Each university shall be non-sectarian and non-political in principle.”



The Establishment and Constitution of the University

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 lack of a quorum at the first meeting of the Senate. In 1908 the earlier act was repealed and a new act established incorporating 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.

Coat-of-Arms

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”.

Courses of Study and Degrees

The University offers instruction in each of twelve faculties and ten schools. Doctoral and Master’s degrees listed below are offered by the Faculty of Graduate Studies which also includes the Schools of Community and Regional Planning and Library, Archival and Information Studies and several institutes and centres. For a listing of Graduate interdisciplinary programs offered refer to the Interdisciplinary Studies entry in the Graduate Studies section.

Degrees Offered

Agricultural Sciences

Bachelor of Science in Agriculture (B.Sc. (Agr.))
 Bachelor of Landscape Architecture (B.L.A.)
 Master of Landscape Architecture (M.L.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 Engineering (M.Eng.)
 Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Architecture

Master of Architecture (M.Arch.)
 Master of Advanced Studies in Architecture (M.A.S.A.)

Arts

Bachelor of Arts (B.A.)
 Bachelor of Fine Arts (B.F.A.)
 Master of Arts (M.A.)
 Master of Fine Arts (M.F.A.)
 Doctor of Philosophy (Ph.D.)

Audiology and Speech Sciences

Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Commerce and Business Administration

Bachelor of Commerce (B.Com.)
 Master of Business Administration (M.B.A.)
 Master of Science in Business Administration (M.Sc. (Bus. Adm.))
 Doctor of Philosophy (Ph.D.)

Community and Regional Planning

Master of Arts in Planning (M.A. (Planning))
 Master of Science in Planning (M.Sc. (Planning))
 Doctor of Philosophy (Ph.D.)

Dentistry

Bachelor of Dental Science (B.D.Sc.)
 Doctor of Dental Medicine (D.M.D.)
 Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Education

Bachelor of Education (Elementary) (B.Ed.)
 Bachelor of Education (Secondary) (B.Ed.)
 Bachelor of Education (Special Education) (B.Ed.)
 Master of Education (M.Ed.)
 Master of Arts in Education (M.A.)
 Doctor of Education (Ed.D.)
 Doctor of Philosophy (Ph.D.)

Family and Nutritional Sciences

Bachelor of Home Economics (B.H.E.)
 Bachelor of Science in Dietetics (B.Sc. (Dietet.))
 Master of Arts (M.A.)
 Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Forestry

Bachelor of Science in Forestry (B.S.F.)
 B.Sc. (Forestry)
 B.Sc. (Natural Resources Conservation)
 Master of Forestry (M.F.)
 Master of Science (M.Sc.)
 Master of Applied Science (M.A.Sc.)
 Doctor of Philosophy (Ph.D.)

Human Kinetics

Bachelor of Human Kinetics (B.H.K.)
 Master of Human Kinetics (M.H.K.)
 Master of Arts (M.A.)
 Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Law

Bachelor of Laws (LL.B.)
 Master of Laws (LL.M.)
 Doctor of Philosophy (Ph.D.)

Library, Archival and Information Studies

Master of Library and Information Studies (M.L.I.S.)
 Master of Archival Studies (M.A.S.)

Medicine

Bachelor of Medical Laboratory Science (B.M.L.Sc.)
 Doctor of Medicine (M.D.)
 Master of Health Administration (M.H.A.)
 Master of Health Science (M.H.Sc.)
 Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Music

Bachelor of Music (B.Mus.)
 Master of Music (M.Mus.)
 Doctor of Musical Arts (D.M.A.)
 Doctor of Philosophy (Ph.D.)

Nursing

Bachelor of Science in Nursing (B.S.N.)
 Master of Science in Nursing (M.S.N.)
 Doctor of Philosophy (Ph.D.)

Pharmaceutical Sciences

Bachelor of Science in Pharmacy (B.Sc. (Pharm.))
 Master of Science (M.Sc.)
 Doctor of Pharmacy (Pharm.D.)
 Doctor of Philosophy (Ph.D.)

Rehabilitation Sciences

Bachelor of Science in Occupational Therapy (B.Sc. (O.T.))
 Bachelor of Science in Physical Therapy (B.Sc. (P.T.))
 Master of Science (M.Sc.)

Science

Bachelor of Science (B.Sc.)
 Master of Science (M.Sc.)
 Doctor of Philosophy (Ph.D.)

Social Work

Bachelor of Social Work (B.S.W.)
 Master of Social Work (M.S.W.)

Diplomas Offered

Administration for Engineers
 Administration for Foresters
 Applied Creative Non-Fiction
 Applied Linguistics
 Art History
 Education
 Film Studies
 Forestry (Advanced Silviculture)
 Meteorology
 Oral Medicine
 Oral Pathology
 Oral Radiology
 Periodontics (in conjunction with an M.Sc. in Dental Science)
 Translation (French)

Certificate Offered

Site Planning

Honorary Degrees

The degrees of Doctor of Laws (Honoris Causa), Doctor of Science (Honoris Causa) and Doctor of Letters (Honoris Causa), LL.D., D.Sc., and D.Litt., respectively, 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 Master's gown is the same, without cord. The Ph.D. regalia consists of a gown, Cambridge style, of maroon silk material with

front facing panel and sleeves of UBC blue with gold piping; hood, Cambridge pattern, blue silk outside and gold lining; cap, decanal bonnet, of maroon silk with gold cord and tassel. The Ed.D. regalia consists of a gown similar in style to that of the Ph.D., but of black stuff; hood American style with lining of light blue and with chevron of University blue, white and gold; cap, decanal bonnet of black stuff with gold cord and tassel. The D.M.A. regalia is similar to that of Ed.D., with hood lined with alizarin crimson and a chevron of University blue and gold.

The colours for the various degrees are:

B.A.	University blue
B.F.A.	University blue with magenta cord
B.A.Sc.	scarlet
B.Com.	light grey with black and grey cord
B.Ed.	white with cord of University blue
B.H.E.	turquoise
B.L.A.	maize with scarlet cord
M.L.S.	cadmium yellow
M.A.S.	University blue with silver and cadmium yellow twisted cord
B.Mus.	University blue with cord of alizarin crimson
B.Sc.	light blue
B.Arch.	scarlet with white cord
B.D.Sc.	blue and red with twisted cord on white
D.M.D.	blue and red
Ed.D.	royal blue and light blue, with blue, white and gold chevron
B.H.K.	malachite green
B.Sc. (Agr.)	maize
B.Sc. (Dieter.)	turquoise with gold and white twisted cord
B.S.F.	brown with green cord
B.Sc. (Forestry)	brown with a light blue cord
B.S.N.	scarlet with twisted cord of University blue and white
B.Sc. (Pharm.)	dark green with cord of scarlet
B.Sc. (O.T.)	scarlet and white twisted cord on royal blue
B.Sc. (P.T.)	scarlet and white twisted cord on royal blue
B.S.W.	magenta
LL.B.	anethist violet
M.D.	scarlet and royal blue
B.M.L.Sc.	scarlet and royal blue twisted cord on white
M.H.A.	red and pale blue
M.H.Sc.	scarlet and grey
M.A. (Planning)	University blue with dark green and slate grey
M.Sc. (Planning)	University blue with dark green and white
Ph.D.	blue and gold
D.M.A.	royal blue and alizarin crimson, with blue and gold chevron
Pharm.D.	American style with lining of University blue and with chevron of University 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 M.Sc. (Bus. Admin.) hood is similar to that of M.Sc. with grey trim and black and white cord. The M.Eng. hood is the same as that of the M.A.Sc. except that it is trimmed with a University blue cord. 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.

CONTINUING STUDIES AT UBC

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CREDIT PROGRAMS

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Fax: (604) 822-2178

Continuing Studies coordinates and administers credit courses offered after 4:30 pm during Winter Session, in the daytime and evening in Summer Session, and through directed study abroad. In cooperation with departments across faculties, an expanding number of degrees are available entirely through part-time study.

Continuing Studies also offers credit courses for home study in Agricultural Sciences, Arts, Education, Forestry and Nursing (post-RN). These distance education programs provide a flexible study option for students unable to attend scheduled classes.

Continuing Studies credit courses carry full credit towards degree or diploma programs in accordance with the requirements of the faculty concerned.

ACADEMIC PREPARATION PROGRAMS

UBC Writing Centre – (604) 822-9564

Through the Writing Centre, Continuing Studies offers daytime, late afternoon and evening non-credit courses in language and composition designed to help students develop the writing and editing skills necessary to meet the standards for first-year English. *Writing 098* is intended primarily for UBC students who have not yet achieved a level 5 or 6 on the Language Proficiency Index (LPI). Non-UBC students who have completed high school or who are over 18 years of age are also welcome. *The fee is \$245.*

Two new courses are also offered: *Writing the Literary Essay and Report and Thesis Writing.*

Math Centre – (604) 822-2666 or 822-0801

In cooperation with the Math Department, Continuing Studies offers a non-credit course in the pre-calculus material needed for first-year calculus courses. Noon-hour or evening classes are small, for individual attention, and build on the Math 12 high school curriculum. *Math 012* is intended primarily for regular UBC students who need to refresh their basic math skills or who need Math 12 as a prerequisite for a UBC calculus course. Non-UBC students who have completed high school or who are over 18 years of age are also welcome. *The fee is \$245.*

NON-CREDIT PROGRAMS

5997 Iona Drive, Vancouver, B.C. V6T 1Z1
Telephone: (604) 822-1444
Fax: (604) 822-1599

Continuing Studies offers over 650 non-credit courses each year, most with no prerequisites. Several *Certificate Programs* are planned for 1995: Multimedia Studies, Software Engineering, Terrain Mapping, Second Language Teaching and Intercultural Development.

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Courses span public affairs, history, art appreciation, literature, writing, and performing and studio arts.

Computer Science – (604) 822-1420

Programs range from skills development using application software to advanced information systems education.

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Field studies and international trips combine exciting destinations with excellent resource specialists drawn from the UBC community.

English Language Institute – (604) 822-1550

Programs are open to Canadian residents, international students and visitors. Daytime courses are offered for part- and full-time study.

Intercultural Training and Resource Centre – (604) 822-1436

ITRC delivers programs in intercultural communication, working with university faculties and other organizations. These programs assist professionals to communicate more effectively in an international environment.

Language Programs – (604) 822-0800

Conversational programs are offered evenings or Saturday mornings in French, Spanish, Japanese, Cantonese, Mandarin, Italian, German, Korean or Portuguese. Travel immersion programs and summer language institutes for teachers are also available.

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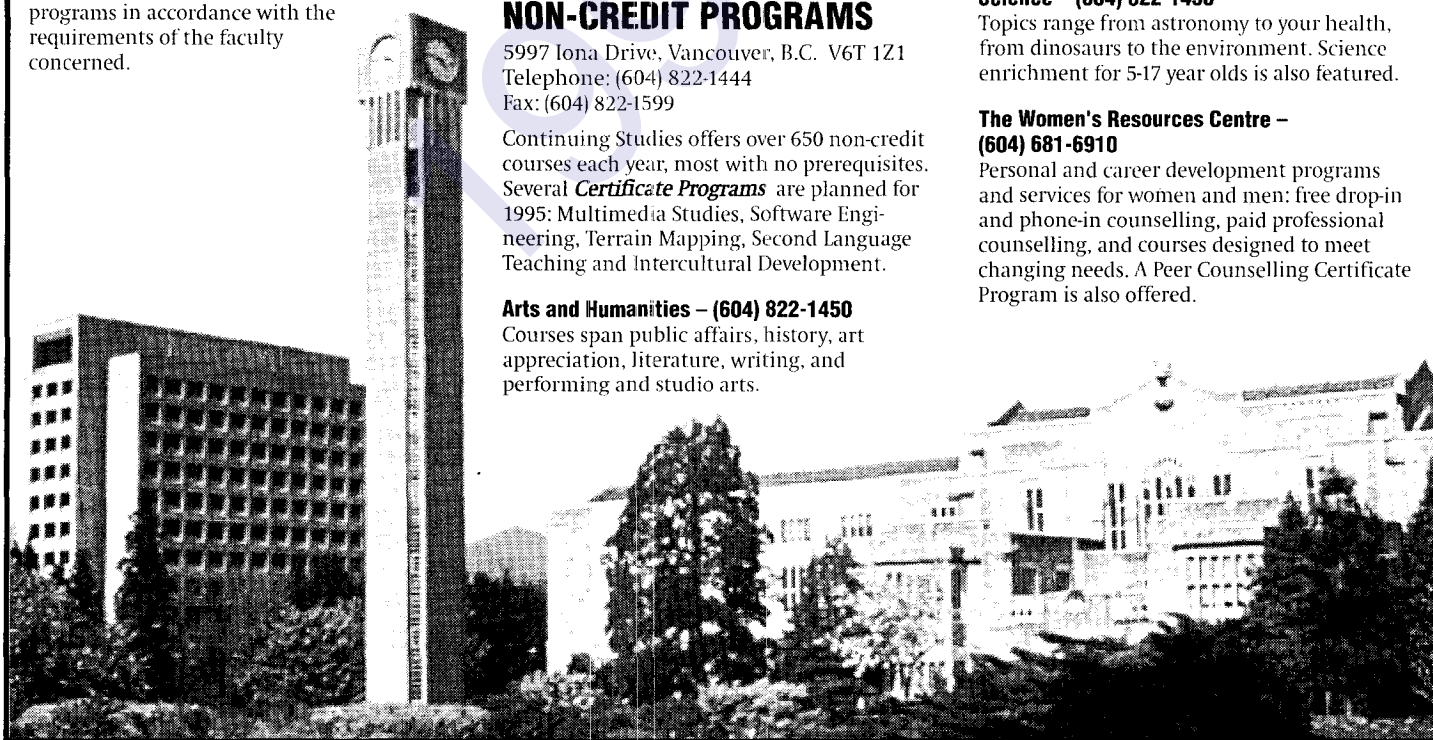
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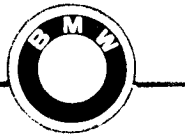


PLEASE CONTACT US FOR FREE BROCHURES AND COURSE CALENDARS WITH FULL PROGRAM DETAILS.

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For further information contact:

Admissions, Coquitlam College
516 Brookmere Avenue
Coquitlam, BC V3J 1W9
Fax 939-0336



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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Undergraduate Admissions

General Policy on Admissions

The University of British Columbia seeks applications from students who can benefit from and contribute to the varied and stimulating academic life at this university. The University's admission regulations and procedures are intended to identify such students and to ensure that they enter programs at a level which will allow them to get the maximum benefit from their university studies.

Excellent students who do not meet all of the published admission requirements may be considered for admission in exceptional cases by the Dean of the Faculty or the Dean's designate.

The University reserves the right, the published regulations notwithstanding, to deny admission on the basis of overall academic record and to limit enrolment by selecting from among qualified applicants those who will be admitted.

Except in special circumstances no student under the age of sixteen is admitted.

Note: Because of enrolment limitations the academic standing required for admission to most programs is higher than the published minimum.

Students with Disabilities

Academically qualified students who have physical, sensory or specific learning disabilities are encouraged to attend The University of British Columbia. The University has a wide variety of services, including several forms of special assistance, designed to accommodate the needs of students challenged by their disability.

Students requiring special assistance or consideration in order to meet program or degree requirements should advise their dean's or director's office of the nature of their disability as soon as they have been admitted or the need for assistance is known to exist. Students with disabilities should also contact the Disability Resource Centre (see index under Disability Resource Centre) for a description of the services available and to arrange access to them.

Appeals

Applications are screened carefully in accordance with Senate policy. The Senate Admissions Committee reviews doubtful cases and cases of appeal against decisions made on the basis of Senate policy.

Transfer Credit or Placement

Transfer credit and/or advanced placement may be given where appropriate. These provisions apply particularly to Advanced Placement and International Baccalaureate (Higher Level). Advanced placement may be assigned in appropriate subjects with high academic achievement on Advanced Level (G.C.E.) and Principal Level (H.S.C.). Interested students should inquire at Undergraduate Admissions, Registrar's Office, for more information.

Admission to Undergraduate Programs Requiring Prior Study

Admission requirements for undergraduate programs requiring either substantial progress towards or completion of a prior degree are specified in entries for the Faculties and Schools offering these programs. Applicants are advised that in some cases a recognized prior degree may not satisfy requirements for specific pre-admission studies.

Admissions

The admission requirements in this section refer to the minimum educational level necessary for admission to the University. Reference must also be made to those sections of the *Calendar* giving specific requirements for admission to the various programs of study in the Faculties and Schools.

English Language Admission Standard

As English is the medium of instruction at the University of British Columbia all applicants, regardless of country of origin or of citizenship status, will be required to demonstrate competence in the English language prior to admission.

Note: This requirement is distinct from the Language Proficiency Index (LPI) requirement for first-year English courses at UBC. Please consult the following entry for further information about the LPI.

With the exception of applicants to the Faculty of Graduate Studies, applicants may demonstrate English language competence by one of the following:

- Five years of full-time education in English in Canada or the equivalent in another country where English is the principal language. Such education must include B.C. Grade 12 or equivalent and can be in a combination of secondary and post-secondary education.
- A score of 570 minimum on the Test of English as a Foreign Language (TOEFL). Some programs have a higher minimum, e.g., 580 for programs in the Faculty of Arts. A score of at least 90 on the Michigan English Assessment Battery (MELAB). TOEFL or MELAB tests taken more than two years prior to application for admission will not be considered.
- Successful completion of six credits of post-secondary English studies for which UBC gives transfer credit.
- A grade of 80% or better on the Provincial Examination portion of B.C. English 12 or English Literature 12 or the equivalent; or a grade of 6 or 7 on the International Baccalaureate Higher Level English course; or a grade of 5 on the Advanced Placement English (Language Composition: Literature and Composition).
- Successful completion of the equivalent of five years of full-time instruction in a school/institution in Canada in which the major language of instruction is other than English but where the level of English proficiency required is equivalent to that in English language schools/institutions in Canada. (This will include applicants from CEGEPs who have completed English as a first language.)
- Graduation from a recognized degree program at an accredited university at which English is the primary language of instruction and in a country where English is the principal language.

Language Proficiency Index (LPI) Requirement for First-Year English

All programs require at least three credits of first-year English; most require six credits. Before enrolling in any first-year English course or Arts One, students must complete the Language Proficiency Index (LPI) and achieve a minimum score of level 5 (30/40) on the essay section of the examination.

Exemptions

Students in the following categories are exempt from the LPI requirement: all other students must complete the LPI and achieve a minimum score of level 5 (30/40) on the essay section of the examination:

- those with a final grade of "A" in English 12, English Literature 12, or OAC English at the time when they gain access to TELEREG;
- those with a grade of 5 in the Advanced Placement course in literature and composition and those with a grade of six or seven in the International Baccalaureate course in English Literature;
- those who passed UBC's English Composition Test (ECT) prior to September 1992;
- those who have completed six credits of first-year English or the equivalent.

Deadlines for Completion of the LPI

In order to be eligible for term one English courses (English 110, 111, 112 or 120), students must complete the LPI by the following deadlines:

- B.C. students: Thursday, August 3, 1995
- Out-of-Province students: Thursday, August 17, 1995

Any student who misses the deadline must contact Judy Brown at the First-Year English Office. For assistance, telephone (604) 822-5651 or (604) 822-4247.

Registration for the LPI

- **B.C. Students** – The LPI is offered a number of times and at a number of locations around British Columbia each year. Students must register for the examination at least two weeks in advance.

On the registration form, or in a personal letter, the student should include his or her name, address and postal code, telephone number, and the date, time, and place the student wishes to write the examination. The registration fee of \$35 (either VISA, MasterCard, money order, or personalized cheque with the student's name clearly indicated, payable to LPI) must accompany the application. The application can be faxed (if the payment is by VISA or MasterCard), mailed, or brought to the LPI Office, University of British Columbia, Room 1311-2125 Main Mall, Vancouver, B.C. V6T 1Z1. Fax: (604) 822-9144. Examination admission tickets will then be mailed to students approximately one week before the examination date. Any student who has not received a ticket three days prior to the examination date should contact the LPI Office at (604) 822-1146 immediately.

Students must present their tickets and photo identification in order to be admitted to the examination room on the day of the sitting.

- **Out-of-Province Students** – Students living outside B.C. may arrange a private sitting of the examination in their own area. To do so, they should contact a high

school, college or university administrator or counsellor who would be willing to supervise their writing of the LPI. The administrator or counsellor should contact the LPI office (on official letterhead) by fax at (604) 822-9144 or at the address listed above, and indicate willingness to undertake the supervision. The registration fee of \$45.00 (\$55.00 for the examination plus a \$10.00 private sitting charge) may be paid by VISA, MasterCard, or personalized cheque payable to LPI. Application and payment may be made by fax or by mail as indicated above.

Upon receipt of the application, payment, and a letter from the supervisor, the LPI office will send a copy of the examination to the supervisor, who can then arrange with the student where and when the examination will be written. (Any charge for invigilation services is the responsibility of the student.) The supervisor must return the examination paper to the LPI office within four weeks unless a later date has been specified in writing to the LPI office.

The Examination

The LPI is a two and a half-hour examination that provides the University with a way to determine a student's competence in summary and essay writing and in the recognition of common errors in English usage and sentence structure. Part I requires students to identify errors in sentence structure; Part II requires them to identify errors in English usage; Part III involves the evaluation of summary of paragraphs; and Part IV involves the composition of an expository essay of between 300 and 400 words. Performance on the essay will determine a student's eligibility for first-year English courses, but students must complete all parts of the examination. Incomplete papers will not be marked.

An 80-page information and practice booklet entitled *Preparing to Write the LPI* is available from the LPI office for a fee of \$13.70 (GST and postage included).

Results

Students' results will be mailed to them within four weeks of the writing of the examination and forwarded to the English Department immediately upon the completion of marking. Students should **keep** the report of their results; they may be asked to present results in their English classes in September.

Students with scores of **level 5 or 6** on the essay section should proceed with enrolment in their first-year English courses or in the Arts One program; those with a **level 4 or below** cannot register either in a first-year English course or in the Arts One program. Students in this latter category are strongly advised to enrol in Writing 098, a non-credit course in the University Writing Centre, telephone (604) 822-9561.

Further Enquiries

For further information about the LPI, contact the LPI office, Room 1311 - 2125 Main Mall, University of British Columbia, Vancouver, B.C. V6T 1Z1; telephone (604) 822-4146; fax (604) 822-9144.

For further information about eligibility for first-year English courses, contact the English Department, telephone (604) 822-4217 or (604) 822-5651.

For information about the LPI and the Arts One Program, telephone (604) 822-5430.

For information about registration, fees, and withdrawals in connection with Writing 098, contact the University Writing Centre at (604) 822-9561.

LPI Sitings: January 1, 1995 to December 31, 1995

Lower Mainland

January 7	9 am	UBC
January 21	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond
February 25	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond
March 18	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Surrey
	9 am, 1:30 pm	Kwantlen, Richmond
	9 am, 1:30 pm	Kwantlen, Langley
	9 am, 1:30 pm, 7 pm	Douglas College
	9 am, 1 pm	Capilano College
March 29	Participating BC high schools (restricted to students attending individual schools)	
April 22	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm	Kwantlen, Richmond
May 20	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm	Kwantlen, Richmond
	9 am, 1:30 pm	Kwantlen, Langley
June 10	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm	Kwantlen, Richmond
July 8	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Surrey
	9 am, 1:30 pm	Kwantlen, Richmond
	9 am, 1:30 pm	Kwantlen, Langley
	9 am, 1:30 pm, 7 pm	Douglas College
	9 am, 1 pm	Capilano College
July 22	9 am, 1 pm	UBC
July 29	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond
August 12	9 am, 1:30 pm, 7 pm	Langara College
August 19	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond
August 26	9 am, 1 pm	UBC
September 9	9 am, 1 pm	UBC
September 23	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond
October 21	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond
November 18	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Surrey
	9 am, 1:30 pm	Kwantlen, Richmond
	9 am, 1:30 pm	Kwantlen, Langley
	9 am, 1:30 pm, 7 pm	Douglas College
	9 am, 1 pm	Capilano College
December 1	7 pm	UBC
December 9	9 am, 1 pm, 4:30 pm	UBC
	9 am, 1:30 pm, 7 pm	Langara College
	9 am, 1:30 pm	Kwantlen, Richmond

Other Locations

January 7	9 am	Malaspina, Nanaimo
January 14	9 am	UCC Kamloops
February 8	6:30 pm	UCC Williams Lake
February 18	9 am	UCC Kamloops
March 18	9 am	OUC Kelowna
	9 am	UCC Williams Lake
	9 am	UCC Kamloops
	9 am	Selkirk, Castlegar
	9 am	Malaspina, Nanaimo
March 20	1 pm	Malaspina, Duncan

March 29	4 pm	NIC Port Alberni
	Participating BC high schools	
April 8	9 am	UCC Kamloops
April 12	6:30 pm	UCC Williams Lake
May 3	6:30 pm	UCC Kamloops
May 10	6:30 pm	UCC Williams Lake
June 3	9 am	UCC Kamloops
June 8	1 pm	Malaspina, Nanaimo
June 14	6:30 pm	UCC Williams Lake
July 5	6:30 pm	UCC Kamloops
July 8	9 am	OUC Kelowna
	9 am	Selkirk, Castlegar
July 12	6:30 pm	UCC Williams Lake
July 29	9 am	UCC Kamloops
August 2	6:30 pm	UCC Williams Lake
	6:30 pm	UCC Kamloops
August 19	9 am	Malaspina, Nanaimo
August 21	1 pm	Malaspina, Duncan
August 23	6:30 pm	UCC Williams Lake
August 26	9 am	UCC Kamloops
September 7	1 pm	Malaspina, Nanaimo
October 7	9 am	UCC Kamloops
November 4	9 am	UCC Kamloops
November 18	9 am	UCC Williams Lake
	9 am	Selkirk, Castlegar
	9 am	Malaspina, Nanaimo
	1:30 pm	OUC Kelowna
November 20	1 pm	Malaspina, Duncan

Credit for Secondary School Calculus Courses

All prospective UBC students who have completed or who are registered in a calculus course in secondary school (Locally Developed Calculus [LD calculus], AP Calculus AB, or IB Mathematics [subsidiary or higher]) will be allowed to write a MATH 100 (Mathematics 100) examination. Students who pass this will be able to obtain credit for MATH 100 with the mark obtained appearing on their UBC transcripts.

Those students already eligible for credit because of high AP or IB scores will keep this eligibility regardless of their examination score and can waive the examination grade and/or credit. Other students who are not satisfied with their grade may waive the examination grade but then will not receive credit.

Application must be made to the UBC Mathematics Department to write the MATH 100 examination prior to entering UBC from secondary school. Only one attempt is permitted. After registering in a UBC degree program, a student may apply to the Mathematics Department to receive credit for MATH 100. The UBC transcripts will then show challenge credit for MATH 100 with the grade obtained appearing on the UBC transcript.

Registration

Applications to write the MATH 100 examination must be made to the UBC Mathematics Department by March 1 for the April examination, by June 30 for the first Summer Session examination, and by July 15 for the second Summer Session examination. A non-refundable fee, equal to the cost of a one-credit undergraduate course (see Index under "Fees, Undergraduate"), must accompany the application.

Scheduled MATH 100 Sitings for 1995/96

Details relating to UBC room locations will be sent to the student.

1995

April 19 7 pm This sitting of the MATH 100 examination will also take place in participating B.C. high schools.

July 21 7 pm First Summer Session examination
August 12 9 am Second Summer Session examination

1996

July 19 7 pm First Summer Session examination
August 17 9 am Second Summer Session examination

The Examination

The examination is a scheduled 2 1/2-hour MATH 100 final examination.

A course syllabus and samples of recent MATH 100 examinations and their solutions are available from the Mathematics Department for a fee of \$15.00 for Canadian addresses and \$20.00 for non-Canadian addresses (GST and postage included).

Further enquiries about writing the MATH 100 examination should be directed to the Department of Mathematics, The University of British Columbia, 1984 Mathematics Road, Vancouver, B.C., V6T 1Z2; telephone (604) 822-2666, fax (604) 822-6074.

British Columbia/Yukon Secondary School Applicants

Requirements Effective Summer Session 1995

The minimum academic qualification for admission is Secondary School Graduation, including the following Grade 12 and 11 courses:

Grade 12

- English 12
- three additional examinable Grade 12 courses (see Program Requirements, below)

Grade 11

- English 11
- Mathematics 11
- Social Studies 11
- At least one approved Science 11 (see Program Requirements below for programs requiring two Science 11s)
- An approved Language 11 (a beginner's Language 11 does not satisfy this requirement)

The admission average will be calculated on English 12 and the three additional examinable Grade 12 courses.

A minimum average of 67% is required for admission to all programs. However, due to limited enrolment, a higher average is required in most programs.

Notes

- 1) Applicants who because of administrative difficulties in their school cannot present the courses as required may be excused a specific deficiency upon appeal if there is reasonable cause and if the appeal is supported by documentation from the principal of the school concerned.

- 2) All courses must be completed by June. Summer School courses or grades obtained in supplemental examinations will not be considered.

Examinable Grade 12 Courses¹

Biology 12
Chemistry 12
English Literature 12
English 12
Français Langue 12 or French 12
Geography 12
Geology 12
German 12
History 12
Japanese 12
Latin 12
Mandarin 12
Mathematics 12
Physics 12
Spanish 12

Approved Grade 11 Science Courses¹

Biology
Chemistry
Computer Studies
Earth Science
Physics

Approved Grade 11 Language Courses

Athapaskan² (School Dist. 50)
Chilcotin (School Dist. 27)
Français (Communication et Littérature)
Français (Langue)
French
German
Hebrew (Maimonides School)
Italian (School Dist. 39 and 41)
Japanese
Latin
Mandarin Chinese
Nishga (School Dist. 27)
Nuxhalk (School Dist. 49)
Russian (School Dist. 7, 9 and 12)
Shuswap (School Dist. 27)
Spanish

¹ Approved courses offered in French will also be accepted. (Français 12 is not accepted in place of English 12.)

² with Athapaskan 12

Specific Program Requirements Effective Summer Session 1995

The chart on page 49 shows the required courses used in the calculation of the admission average for specific programs, as well as courses which are required but which are not used in the calculation of the average.

International Baccalaureate and Advanced Placement

The University of British Columbia is pleased to recognize enriched secondary school programs of this type. Most courses are eligible for transfer credit or advanced placement.

Concurrent Enrolment Policy

Students who are enrolled in grade 11 or 12 in a B.C. secondary school may be admitted to the University to pursue Concurrent Studies. Normally no more than 12 credits obtained in this way may later be applied towards an appropriate degree at The University of British Columbia.

The following conditions will apply at The University of British Columbia:

- The applicant must have a superior academic record.
- The applicant must be enrolled in a B.C. secondary school at the grade 11 or 12 level, in a program that meets regular UBC entry requirements.

- The applicant must have the written recommendation of the secondary school Principal.
- The applicant must have the written consent of the parent or legal guardian if under the legal age of majority on the opening day of classes.
- The applicant must have the support of the Dean of the Faculty for the courses in which the applicant plans to enrol.
- Admission will generally be limited to one academic session; however, this may be renewable with the continued support of the school Principal and the faculty Dean.

Students in Concurrent Studies will be treated as regular students in most respects except that they may not register in a full range of courses and their eligibility to register is valid for one academic session only (unless renewed as per above). Standard transcripts will be issued and fees and deadlines will be as for regular students.

Students who have enrolled in Concurrent Studies at other recognized post-secondary institutions prior to secondary school graduation may also be eligible for transfer credit.

Adult Basic Education – Provincial Diploma

The University recognizes the ABE Provincial Diploma for admission to the first year of an undergraduate program. A minimum average of "C+" is required based on mathematics, English, a science and a language at the Advanced Level and English plus three academic subjects at the Provincial Level chosen from the following: biology, chemistry, physics, geography, history, literature, mathematics, and computer science.

Note: University transfer courses may not be used as part of the ABE Provincial Diploma for admission to UBC.

Applicants for Transfer from a College or University in British Columbia

The University will accept students on transfer from public colleges on the same basis as students transferring from a provincial university. A student who chooses courses at a public college that are appropriate to an academic objective at the University and who obtains adequate standing in them will be accepted for further studies at the University under the same conditions that apply to a student who has taken all post-secondary studies at the University. A student with an unsatisfactory record at a college or another university will not be accepted for transfer.

Transfer Policy

- 1) **General Admission Requirements** – The basic principle is that transfer be considered only for those students whose previous academic records are satisfactory. The minimum academic standing to qualify for admission to the University is a C average or grade point average of 2.0 (calculated on a 4-point scale: A+=4.33, A=4.0, A-=3.67, B+=3.33, B=3, B-=2.67, C+=2.33, C=2, C-=1.67, D+=1.33, D=1, D-=0.67, F=0) on all college or university courses attempted, including failures and repeated courses. Certain schools and faculties require a higher grade point average for admission and some may require a minimum standing in specific courses. Note: Because of enrolment limitations the academic standing required for admission to most programs is higher than the published minimum. B.C. Regional College students

should refer to the College-University Transfer Guide for assistance in planning their college programs.

- 2) **Unassigned Credit** – May be granted for university transfer courses where a course-to-course equivalent cannot be established. This credit may be used as elective credit. Elective credit may be either in a particular discipline, e.g., "Economics (3) credits," or in a Faculty, e.g., "Arts (6) credits." Students should be cautioned that specific requirements exist at the Faculty level and in most Department programs. These cannot normally be fulfilled by elective credit.
- 3) **Minimum Passing Grades** – Students transferring from any college or university may be granted transfer credit for courses in which the minimum passing grade has been obtained, subject to the approval of the faculty/school concerned.
- 4) **Courses Taken at Other Institutions** – The University accepts for transfer credit courses taken at recognized colleges and universities (including the British Columbia Open Learning Agency/Open Learning Consortium) if the subject matter is in an area taught at UBC, or is applicable to the program being taken at UBC. The amount of credit granted is limited to a maximum depending upon the particular study program elected. In general transfer credit is limited to the initial two years of a degree program, but credit at a more senior level is possible if prior permission has been obtained from the Faculty concerned. Students enrolled in UBC degree completion programs at Cariboo and Okanagan Colleges enjoy special status. Such students may transfer up to a maximum of 90 credits should they wish to complete their degree program at UBC. Of these 90 credits, the maximum number of credits of 100- and 200-level courses that may be transferred is 66, and the maximum number of credits of 300- and 400-level courses that may be transferred is 30. Of the 300- and 400-level courses applicable to any particular Major or Honours program, at least 15 credits of such courses must be completed at UBC. All UBC departmental requirements regarding Major and Honours programs must also be met.
- 5) **Course Descriptions** – Students applying for admission on transfer to this University from another University or College may be required to supply a current copy of the calendar of the University at which they have previously studied in order that an evaluation of their records can be made.
- 6) **Challenge Credit** – Courses that have been successfully "challenged" at other institutions will be useful to provide advance placement at the University, but credit for such courses will not be given toward a degree. The University of British Columbia will grant credit on transfer only where the course concerned is recognized by the University as suitable for transfer credit and is taken in the normal way by the student.
- 7) **Appealing for Additional Credit** – Students who feel an error has been made in the credit granted on transfer should first make a written request to the Registrar for a review of credit granted on transfer, and if they are not satisfied with the review decision, they should consult the Dean of the Faculty to which they are seeking admission.
- 8) **Institutes of Technology** – Consideration will be given to applicants from institutes of technology provided they have acceptable standing. Such applicants will be considered for admission and possible advanced standing on an individual basis. Transfer credit for up to one full year of degree study may be granted where appropriate.

Secondary School Applicants from other Canadian Provinces

Applicants will be considered for admission to The University of British Columbia who have followed an academic program leading to University Entrance. Students will be required to present English to the Senior Year level and all prescribed subjects for the university studies sought. (See Specific Program Requirements.) Further information on appropriate academic courses is available through the Undergraduate Admissions Office.

Completion of secondary school graduation is mandatory and a minimum average of 67% or equivalent is required.

Note: Because of enrolment limitations the academic standing required for admission to most programs is higher than 67%. Admission to some programs requires a minimum standing in specific courses. Whether secondary school graduation represents 12 or 13 years of schooling the minimum study for a university degree is four years. Transfer credit will not be granted for secondary school courses.

The following requirements apply:

- **Ontario** – Ontario Secondary School Diploma with six Ontario Academic Courses (OAC's) including English (OAC I).
- **Quebec** – At least one year of an academic diploma program of a CEGEP with an overall average of 75% or a completed CEGEP diploma with an overall average of 70%. Transfer credit for up to one full year of degree study may be granted where the two-year diploma has been awarded.
- **Alberta, Saskatchewan, Manitoba, New Brunswick, Nova Scotia, P.E.I., Newfoundland, and Northwest Territories** – Grade 12 graduation with standing in at least five academic Grade 12 courses including English.

Note: Early admission is possible for students with strong academic standing enrolled in the final year of secondary school. Applicants must arrange for their schools to provide an official transcript which includes any final grades for the current year and a list of courses in progress with interim grades. Conditional offers of early admission are subject to satisfactory completion of secondary school graduation requirements and maintenance of the current admission average for the program to which acceptance has been offered. Offers of admission will be withdrawn from students who do not satisfy these conditions.

Applicants Transferring from Post-Secondary Institutions in Canada

The minimum academic standing required for admission to the University is a "C" average or grade point average of 2.0 (calculated on a 4-point scale: A+=1.33, A=1.0, A-=0.67, B+=0.33, B=0, B-=0.67, C+=0.33, C=0, C-=0.67, D+=0.33, D=0, D-=0.67, F=0) on all university transfer courses attempted including failures and repeated courses. Certain Schools and Faculties require a higher grade point average for admission and some may require a minimum standing in specific courses.

Note: because of enrolment limitations the academic standing required for admission to most programs is higher than the published minimum.

Institutes of Technology and Colleges of Applied Arts and Technology

Consideration will be given to applicants from institutes of technology and colleges of applied arts and technology provided they have acceptable standing. Such applicants will be considered for admission and possible advanced standing on an individual basis.

Universities and other Colleges

A student must present an entirely satisfactory academic record with an overall average of at least 60% or the equivalent. Certain Schools and Faculties require a higher average for admission. See first paragraph in this section.

Notes

- 1) A student who is on academic probation at another post-secondary institution is not eligible for admission to The University of British Columbia.
- 2) An applicant who has studied at a university or college outside Canada must submit an appropriate calendar from that institution at the time of application to The University of British Columbia.

International Applicants

The University of British Columbia welcomes applications for admission from outstanding students from other countries. However, because of the limited number of places available for international students in undergraduate programs, competition for admission is keen and superior academic standing is required for admission.

English Proficiency

See Index under English Language Admission Standard.

Minimum Standing for Admission in terms of Educational Credentials

All students must present prerequisites appropriate for their intended program of study.

- **General Certificate of Education (G.C.E.) or General Certificate of Secondary Education (G.C.S.E.)** – A Certificate with standing in at least five subjects, including English, with two at the Advanced Level.
- **School Certificate (S.C.)** – A Division I Certificate with standing in at least five different subjects, including English, with two at the Principal Level on the Higher School Certificate (H.S.C.).
- **International Baccalaureate (I.B.)** – A Diploma with standing in at least six subjects, including English, three at the subsidiary level and three at the higher level, with a Diploma awarded.
- **Certificate of Matriculation** – Applicants who have matriculated at a recognized university may be admitted provided subject prerequisites and academic standing for admission to UBC are met.
- **Secondary School Graduation in the United States of America** – Secondary School graduation from an academic program with the required average on academic courses completed in grades 11 and 12. The Secondary School subjects must include four years of English and at least three years of Mathematics.

Notes

- 1) Because of the differences in world educational systems, satisfactory completion of secondary school is not necessarily an acceptable basis for admission to first year. The University of British Columbia reserves the right to determine whether or not a student is eligible for admission and to determine what transfer credit, if any, may be granted.

- 2) Applicants presenting appropriate subjects with high academic achievement on the (Advanced Level (G.C.E.), Principal Level (H.S.C.)), Higher Level (I.B.), or Advanced Placement will, where appropriate, be considered for advanced placement or transfer credit.
- 3) Applicants should realize that the financial assistance that is available at the undergraduate level is very limited and that opportunities for gainful employment will be severely restricted as a result of immigration regulations.

Undergraduate Admission Procedure

Enquiries concerning admission should be made to:

The University of British Columbia
Undergraduate Admissions, Registrar's Office,
Brock Hall
2016 – 1874 East Mall
Vancouver, B.C.
V6T 1Z1
Telephone (604) 822-3014; Fax (604) 822-3599

Application and Document Deadlines for the various Faculties and Schools are shown at the beginning of this *Calendar*. All necessary educational documents and an Application for Admission form must be submitted by the designated date.

For those Faculties/Schools which have more eligible applicants than they can admit, applications received after the deadline will be returned to the applicants. For those Faculties/Schools which expect to have space available, late applications may be accepted. However, late applications will only be considered after all other eligible applications and it may not be possible to process them before the start of classes. Applications which are not complete by the document deadline may be cancelled if the program sought has been filled by that date.

Documents submitted in support of applications become the property of the University and may not be returned to the student.

Notification of admission decisions is given to applicants after all necessary documents have been received and evaluated. Offers of admission and information concerning registration procedures will be provided to all successful applicants.

Students receiving offers of admission to most limited enrolment programs will have their offer of admission revoked and their eligibility to register cancelled if they do not register by the cancellation date given in their letter of acceptance. Offers of admission or readmission are valid only for the session(s) indicated on the letter of acceptance.

Registration

Registration is the process of formally assigning and recording the enrolment of a student usually in a course or courses. Registration is available only to those students who have received a letter of acceptance for admission or readmission, or to students continuing from one Winter Session to the next, whose statement of grades indicates eligibility to continue.

Students register at UBC using touch-tone telephones to access the Student Information System (SIS). There are certain courses that are not available through this system and these are identified in the course schedule section of the *Registration Guide*. Registration as an auditor is not available via the SIS.

New students and students who have applied for readmission to the University will receive a letter of acceptance followed by a registration package.

Registration Deposit

A registration deposit of \$100.00 for the Winter Session, must be paid within two weeks of initial registration. In the case of the final two weeks of registration, all fees, including the deposit, must be paid by September 6, 1995.

If the student attends the session the deposit is applied to the tuition fees for that session. Failure to pay the deposit will result in the student's registration being cancelled and all courses being dropped. The deposit is not refundable if the student fails to attend the session.

Warning

If all relevant documents have not been received by the Registrar's Office at least six weeks prior to the beginning of the session applied for it is unlikely the application for admission can be processed in time to permit registration.

Student Declaration and Responsibility

Each student is required to furnish the information necessary for the University record, to keep the Registrar's Office informed of changes in name, address, etc., and is bound by 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."

The University authorities do not assume responsibilities which naturally rest with adults. 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.

Classification of Students

In terms of academic studies being followed there are eight categories of students:

- 1) **Regular:** a student enrolled for studies leading to a degree or a diploma whether on a full-time or a part-time basis.
- 2) **Qualifying:** a student enrolled in make-up studies in preparation for registration as a regular student in a graduate or professional program. Qualifying status is granted only to those students who are recommended for such status by the Departments concerned and the Faculty of Graduate Studies.
- 3) **Unclassified:** a student enrolled for studies not intended to lead to a particular degree or diploma. Unclassified students should normally have a recognized degree. Students without a degree who are eligible for admission to the university may be admitted as unclassified students (a) to allow them to take a limited number of courses in a specific area to upgrade or achieve a qualification, or (b) when they are not admissible to or do not wish to enter a specific program. Students in category (b) may take no more than 12 credits per academic year and no more than 18 credits in total while registered as unclassified. Admission as an unclassified student does not guarantee that a student will be able to register for any course offered. Unclassified students may only register in a

course with the permission of the Faculty giving the course. Admission as an unclassified student does not imply future admission as a regular student.

Unclassified students will not receive transfer credit since they are not in a program to which credit can be transferred. Unclassified credits will not be transferred to graduate programs. Students with a failed year in a Faculty will not be admitted as unclassified until they have discontinued their studies for at least one year. After a second failed year admission as unclassified will be subject to the approval of the Senate Admissions Committee.

- 4) **Visitor:** a student enrolled in studies for transfer to a degree program at another recognized university (see also items 21, 22, and 23 in the Fees section). Student must be in good standing at the home university and must submit official transcripts and a Letter of Permission with their application. Course registrations will be made on a space-available basis only.

Note: A Letter of Permission is valid for one session only. A Letter of Permission must be submitted for any subsequent sessions in which a student wishes to register for courses.

- 5) **Exchange:** a visiting student studying at the University of British Columbia under a Senate approved student exchange program and enrolled in studies for transfer to a degree program at another university.
- 6) **Concurrent Studies:** a student who is enrolled in Grade 11 or 12 in a B.C. secondary school and who has been admitted to the University to pursue concurrent studies (see Admission to the University, Concurrent Enrolment Policy).
- 7) **Resident:** a dental resident, medical resident or intern or pharmacy resident registered in a post-graduate training program in the Faculty of Dentistry, the Faculty of Medicine or the Faculty of Pharmaceutical Sciences.
- 8) **Auditor:** a student registered in a credit course whose participation is limited to that deemed appropriate by the instructor but who, in general, is expected to maintain the same schedule of readings as regular students although not expected to write examinations.

An auditor may not transfer to the category of regular student during the term nor may a regular student transfer to the category of auditor except upon the recommendation of the Dean of the Faculty concerned.

Application for admission as an auditor must parallel the procedures for the application of regular students. The application for admission must be accompanied by a written explanation of the reason that status as an auditor is sought. Where an applicant has not met formal requirements for admission to the University, or to the course involved, a full statement of previous relevant activities must be submitted with the application in order that consideration can be given for special admission in the category "mature." Once formal application has been made the decision on acceptance or otherwise will be made by the Dean of the Faculty concerned or the Dean's delegate.

The fees for auditors will be the same as those for regular undergraduate students.

There will be a statement of "audit" on the permanent academic record for any course taken by a student as an auditor. Students taking a combination of credit and audit courses will be subject to restrictions on maximum work load imposed by the Faculties as interpreted by Faculty advisers.

Other Applicant Types

- **Senior Citizens** – B.C. residents who are Canadian citizens or permanent residents aged 65 years or over, who are eligible for admission to the University may enrol in credit courses without payment of tuition fees (see Fees section). This does not apply, however, to areas where only a limited number of students may be accommodated, such as Medicine, Dentistry, Law, Nursing, or any faculty or department where existing facilities and resources are limited.
- **Mature Students** – A student classified as “mature” is one who is a resident of B.C., whose formal education has been interrupted and who lacks formal university matriculation but whose interests and activities have led to continued intellectual development to an extent that would permit acceptance of the student to the University. The University reserves the right to determine whether or not a student can be classified as “mature”; the determination will not be made on the sole criterion of chronological age.

An applicant who applies for admission as a mature student and is not granted admission in this category will be advised of an alternate route of study, usually at a college, in order to prepare for future admission as a regular student.

Each applicant is considered on an individual basis. Application must be made to the Registrar, giving the applicant's school and employment background. It may be necessary for the applicant to be interviewed by the Dean of the Faculty concerned. A mature student is permitted to undertake degree or diploma studies on the same basis as a fully-matriculated student.

Admission to the Faculty of Graduate Studies

The minimum requirement for admission to the Faculty of Graduate Studies is graduation from a recognized university or four-year college with at least a bachelor's degree in an honours program or the equivalent. The standing required is at least an upper second class. For details, see the Graduate Studies section.

1995-96

Specific Program Requirements for Secondary School Applicants from outside B.C./Yukon

The following requirements are specific to the programs indicated and apply to prospective applicants from outside of the B.C./Yukon area from Secondary School or the equivalent thereof. The requirements are expressed in terms of B.C. high school courses. UBC Admissions will determine equivalency for courses from other areas.

Prospective applicants should be aware that these are **not** the requirements for admission to the university. University admission requirements are listed in the Admissions section by applicant category.

Program of Studies in	Secondary School Graduation Must Include	In Addition If Possible
Agricultural Sciences	Math 12 Two of: Biology 11, Chemistry 11, Physics 11 One of: Biology 12, Chemistry 12, Geology 12, Physics 12	Preferably all three
Applied Science (Engineering) A professional four-year program (may also be entered following one or more years in Science.)	Chemistry 11 and 12 Math 11 and 12 Physics 11 and 12	
Architecture A professional program requiring completion of a first degree for admission. For specific secondary school program requirements see Applied Science, Arts or Science.		
Archival Studies A professional program first requiring completion of a Bachelor's degree. See requirements for the Faculty of Graduate Studies.		
Arts Physical Geography and Honours Psychology Economics Speech Science Major (Linguistics) Languages other than English required for B.A. degree: a) French 12 or another language 12, or b) French 11 or another language 11 plus one University year (6 credits) in same language. c) Two University years (12 credits) in a language.	Math 11 Math 12 Math 12	Math 12 Physics 12
Audiology and Speech Sciences A graduate program first requiring completion of a B.A. degree in Speech Sciences or Psychology. See Arts requirements (under Linguistics).	Math 12	Physics 12
Commerce and Business Administration A professional program first requiring completion of undergraduate preparatory year. (See Commerce Section.)	Math 12	
Dentistry D.M.D. A professional program first requiring completion of a minimum of three years in Science or Arts, or the equivalent thereof. See requirements for Faculty of Science. Dental Hygiene (B.D.Sc.) A degree completion program requiring graduation from a Dental Hygiene Program accredited by the Commission on Dental Accreditation of Canada (minimum 65% or 2.5 GPA).		
Education The minimum requirement for admission to the Elementary Program is completion of three years (90 credits) of an approved course of study leading to a degree at UBC with an overall standing of not less than 65%, or the equivalent at an approved university. For admission to the Secondary Program , the minimum requirement is a completed Bachelor's degree in Arts, Science, Human Kinetics, Commerce, or Home Economics with appropriate background in the selected teaching subject(s).		
Family and Nutritional Sciences Dietetics major (B.Sc. (Dietet.))	Math 12, Chemistry 11, Physics 11	Biology 11, Chemistry 12, Foods 11 and 12
Family Science major (B.A.) . See requirements for Faculty of Arts. Home Economics major (B.H.E.)	Math 12	Biology 11, Chemistry 12 Family Management 11 and 12 Foods 11, 12A and 12B Textiles 11 and 12
Nutritional Sciences (B.Sc.) . See requirements for Faculty of Science		

Specific Program Requirements for Secondary School Applicants from outside B.C./Yukon

Program of Studies in:	Secondary School Graduation Must Include	In Addition If Possible
<p>Forestry</p> <p>B.S.F. and B.Sc. (Forestry) programs with admission following:</p> <p>a) Secondary School b) First Year Science or equivalent; c) A two-year Forestry diploma program from a recognized institute of technology; or d) An approved one- or two-year Forestry transfer program at a B.C. College</p> <p>B.Sc. (Natural Resources Conservation) program with admission following:</p> <p>a) Secondary School ; or b) First Year University or equivalent</p>	<p>Math 12 Two of: Biology 11, Chemistry 11, Physics 11 One of: Chemistry 12, Physics 12 (B.S.F.) Physics 12 (B.Sc. (Forestry))</p> <p>Chemistry 11, Math 12</p>	All three recommended
<p>Human Kinetics</p>	Math 11, English 12	Math 12, Biology 11 and 12 Chemistry 11, Physics 11
<p>Landscape Architecture</p>	Math 11, Biology 11 Chemistry 11 or Physics 11 A Science 12 (preferably Biology 12) A Social Science 12 (preferably Geography 12)	
<p>Law</p> <p>A professional program first requiring completion of a minimum of three years (90 credits) in an approved undergraduate program. See requirements for Arts, Commerce, etc.</p>		
<p>Library and Information Studies</p> <p>A professional program first requiring completion of a Bachelor's degree. See requirements for the Faculty of Graduate Studies.</p>		
<p>Medical Laboratory Science</p> <p>A professional program requiring a diploma in Medical Laboratory Technology, Registered Technologist General Diploma, and Chemistry 205 and 230 or equivalent (or Chemistry 230 and six credits of Arts electives). Alternative route for Science students requires Biology 110, 120 (or 115 and 120), 201, 201; Chemistry 110 (or 121 and 122), 205, 230; six credits of first-year English; Mathematics 100, 101 (120, 121); Microbiology 200; six credits of first-year Physics from Physics 100, 101, 102; 121 or 122, and an Arts elective (six credits). Applicants seeking the R.T. qualification should consult B.C.I.T. or University College of the Cariboo calendars or other institution offering M.L.T. program.</p>		
<p>Medicine</p> <p>A professional program first requiring completion of a minimum of three years (90 credits) in Arts or Science (or equivalent). See requirements for Faculty of Arts or Science.</p>		
<p>Music (as for Arts)</p> <p>Audition required.</p>		
<p>Nursing</p>	Biology 12, Chemistry 12.	
<p>Pharmaceutical Sciences</p> <p>A professional program first requiring completion of one year in Science (see Science requirements) or Arts.</p>	Math 12, Chemistry 11, Physics 11, Biology 11	Biology 12, Chemistry 12, Physics 12
<p>Rehabilitation Sciences</p> <p>Professional programs in physical therapy or occupational therapy entered following completion of prerequisite studies which normally can be completed in one year at university or college.</p>	Physics 11	Biology 11, Chemistry 11 or 12 Mathematics 11 or 12
<p>Science</p>	Math 12*, Chemistry 11, Physics 11 One of: Biology 12, Chemistry 12, Computer Science 12, Geology 12, Physics 12 (*minimum 67%)	Additional courses from: Biology 11/12, Chemistry 12, Computer Studies 11, Computer Science 12, Earth Science 11, Geology 11, 12, Physics 12
<p>Social Work</p> <p>A professional program first requiring completion of a minimum of two years in the Faculty of Arts (or the equivalent).</p>	Math 11	

Specific Program Requirements for B.C./Yukon Secondary School Applicants

The following requirements are specific to the programs indicated and apply to prospective Secondary School applicants from the B.C./Yukon area. Prospective applicants should be aware that these are **not** the requirements for admission to the university. University admission requirements are listed in the Admissions section by applicant category.

The following chart shows, by Faculty, the specific courses which are used in the calculation of the admission average, as well as the courses which are required but which are not used in the admission average for students entering UBC from a secondary school in B.C. or the Yukon.

Program of Studies to which students may be admitted following Grade 12	Average Calculated on the following Required Courses	Additional Courses Required but not used in the Calculation of the Average
Agricultural Sciences, B.Sc. (Agr.)	English 12 Math 12 One of: Biology 12, Chemistry 12, Geology 12, or Physics 12 One other examinable grade 12 course	English 11 Language 11 Math 11 Two of: Biology 11, Chemistry 11, or Physics 11 Social Studies 11
Applied Science, B.A.Sc.	English 12 Chemistry 12 Math 12 Physics 12	Language 11 Social Studies 11
Arts, B.A.	English 12 Three other examinable Grade 12 courses	English 11 Language 11 Math 11 Science 11 Social Studies 11
Family and Nutritional Science, B.H.E., B.Sc. (Dietet.)	English 12 Math 12 Two other examinable Grade 12 courses	English 11 Language 11 Math 11 Science 11 (B.H.E.) Chemistry 11, Physics 11 (B.Sc. (Dietet.) Social Studies 11
Forestry B.S.F., B.Sc.(Forestry)	English 12 Math 12 One of: Chemistry 12 or Physics 12 (B.S.F.) Physics 12 (B.Sc. (Forestry)) One other examinable Grade 12 course	English 11 Language 11 Math 11 Two of: Biology 11, Chemistry 11, or Physics 11 (all 3 recommended) Social Studies 11
B.Sc. (Natural Resources Conservation)	English 12 Math 12 Two other examinable Grade 12 courses	English 11 Chemistry 11 Language 11 Math 11 Social Studies 11
Human Kinetics, B.H.K.	English 12 Three other examinable Grade 12 courses	English 11 Language 11 Math 11 Science 11 Social Studies 11
Landscape Architecture, B.L.A.	English 12 Math 12 One of: Biology 12, Chemistry 12, Geology 12, or Physics 12 One of: English Literature 12, Geography 12, or History 12	English 11 Language 11 Math 11 Social Studies 11 Biology 11 One of: Chemistry 11 or Physics 11
Music, B.Mus.	English 12 Three other examinable Grade 12 courses	English 11 Language 11 Math 11 Science 11 Social Studies 11
Nursing, B.S.N.	English 12 Biology 12 Chemistry 12 One other examinable Grade 12 course	English 11 Language 11 Math 11 Science 11 Social Studies 11
Science, B.Sc.	English 12 Math 12 (minimum 67%) One of: Biology 12, Chemistry 12, Geology 12, or Physics 12 One other examinable grade 12 course	English 11 Language 11 Math 11 Chemistry 11 Physics 11 Social Studies 11

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Questions & Answers
with Eric Lynds, Sales Manager

Q: I've seen ads for Budget Car Sales in the newspaper for some time now, and I still don't quite understand. What exactly is budget Car Sales and how can they sell new models for so much less than the new car dealers?

A: Budget Car sales is the marketing vehicle for Budget Rent A Car and other major rental car firms and lease companies. Budget Car Sales is your best alternative to a brand new car. Budget offers a wider range of makes and models than you'll ever find at a new car dealer, because we buy from almost every major manufacturer. We can sell for so much less because the cars have been leased for a few months or a few thousand miles. Not only does Budget purchase the vehicles at huge discounts, the initial depreciation is already factored in. When you buy at Budget, the price you pay is a more accurate reflection of the true value of the car.

Q: Are Budget Rental & Lease Cars & Trucks in good condition? Are they abused?

A: Most of our vehicles are leased by people like you and I. Holiday & business trips. No they are not abused. They are serviced and maintained every

time they are returned. Every unit has a 151 point safety and mechanical inspection available for your inspection, also all repairs and maintenance are performed. History provided.

Q: Does Budget Car Sales offer any kind of warranty protection?

A: Yes. Many Budget cars are still covered by the balance of the original new car warranty. That means, if you have a problem, it can be fixed at any authorized dealer. But for even greater peace of mind, we offer a 6 year, 160,000 km. service contract to back you up long after the original warranty expires.

Q: I know Budget's prices are reasonable, but is it possible to finance?

A: Of course, Budget can provide qualified buyers with finance rates competitive with both the new car dealers and even banks. Our finance representatives are in daily contact with major lenders throughout the area, so you can count on them to secure the best terms available. Many of our vehicles even qualify for low, new car finance rates without a penny down! Also all trades welcome.

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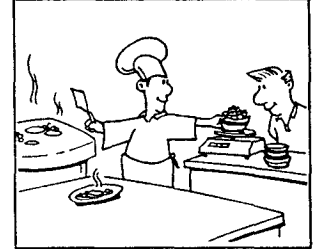
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1. Select your favourite combination from our ingredients bar featuring fresh vegetables, seafood, meat, and poultry.



2. Bring your bowl to be weighed and we'll grill it to your specifications in the savoury sauces you've chosen.



3. Roll up the ingredients in the Mongolian Wraps provided, adding steamed rice & hoisin sauce, or if you can't wait, eat it straight from the plate.



4. Enjoy your unique Mongolian Wrap and imagine what your next creation will be.

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467 W. Broadway

874-6121 11am - 11pm daily

"A Unique Mongolie Experience"

UBC does not endorse any advertiser in this publication.

Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Academic Concession

The University encourages all students to complete their course work and degree programs. Students who are suffering from medical, emotional or other problems which may adversely affect their attendance or performance in a course or program must notify the Office of the Dean of their Faculty or Director of their School, as well as their instructors, as soon as possible.

Students who wish to request academic concession must apply to the Office of the Dean or Director as close as possible to the time their attendance is adversely affected. The University, in considering these requests or any appeals of decisions on academic concession, will not normally take into account untimely notifications. When a student requests academic concession, he or she will be asked to provide such evidence as is deemed appropriate. If there is a medical problem, the student should submit a Statement of Illness obtained from the Student Health Service or the attending physician. The student may be asked to provide additional information. Academic concessions are granted only by the Dean or Director and are a privilege not a right. Among the academic concessions that may be granted are permission to drop a course (see "Change of Registration"), aggregate standing or deferred standing (see "Grading Practices") and withdrawal from the university (see "Withdrawal").

If permission is given to drop a course, it will be removed from the student's record. Any refund of fees will be in accordance with normal policy (see "Refund of Fees").

Students in good academic standing who are permitted to withdraw from the University may apply to re-enrol in the program from which they withdrew. Application to re-enrol must be made by the published application deadline for the program. A student permitted to withdraw may be told the time period during which an application to re-enrol will be permitted. A medical certificate may be required to satisfy the University that the student is ready to continue studies.

In addition to acting in accordance with this general policy, students should also observe the specific provisions on "Examinations" below, and on "Routine Regarding Absence Due to Sickness or Injury" (see Index under "Student Health Service").

Academic Freedom

The members of the University enjoy certain rights and privileges essential to the fulfilment of its primary functions: instruction and the pursuit of knowledge. Central among these rights is the freedom, within the law, to pursue what seem to them fruitful avenues of inquiry, to teach and to learn unhindered by external or nonacademic constraints, to engage in full and unrestricted consideration of any opinion. This freedom extends not only to the regular members of the University but to all who are invited to participate in its forum. Suppression of this freedom, whether by institutions of the state, the officers of the University or the actions of private individuals, would prevent the University carrying out its primary functions. All members of the University must recognize this fundamental principle and must share responsibility for supporting, safeguarding and preserving this central freedom. Behaviour which obstructs free and full discussion, not only of ideas which are safe and accepted but of those which may be unpopular or even abhorrent, vitally threatens the integrity of the University's forum. Such behaviour cannot be tolerated.

Academic Regulations

Freedom from Harassment and Discrimination

The University of British Columbia is committed to ensuring that all members of the university community — students, faculty, staff, and visitors — are able to study and work in an environment of tolerance and mutual respect that is free from harassment and discrimination.

Advancement Regulations

Advancement practices vary among Faculties and are described in the Faculty sections of the *Calendar*.

General regulations applicable to all Faculties are:

- 1) except in special cases, or where the Faculty provides otherwise, no student may repeat a course more than once;
- 2) each Faculty has regulations on advancement. Students who do not meet the required standard in any session will be assigned Failed standing and will be required to discontinue or withdraw;
- 3) a student in a year of study which may normally be taken in the first or second year following secondary school graduation who is assigned Failed standing will be required to either discontinue for at least one year or to withdraw;
- 4) courses which are not for credit toward the student's degree or diploma program will not be included when a student is considered for advancement;
- 5) students who are assigned Failed standing in one Faculty may transfer to another Faculty if they meet the advancement and admission requirements of the second Faculty;
- 6) students who have been required to discontinue or withdraw may be readmitted subject to the regulations of the Faculty which they wish to enter;
- 7) a student at any level of University study who fails for a second time, will be required to withdraw from the University. After a period of at least one year, an appeal for permission to re-enrol will be considered. Such an appeal will be granted only after the appeal has been reviewed and approved by the Dean of the Faculty concerned. A negative decision by the Dean may be appealed to the Senate Admissions Committee.

Attendance

Except where specifically stated otherwise in the regulations of a particular faculty or school a student may not receive a degree without completing the equivalent of two winter sessions in attendance at the University, one of which should be the final year.

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 may not, concurrently with their University attendance, take studies for University degree credit through any other institution by correspondence, evening or regular session class without the approval of the Dean of the Faculty in which they are studying at the University.

The University reserves the right to limit attendance, and to limit the registration in, or to cancel or revise, any of the courses listed. Information concerning limitations on attendance for the various faculties and schools is found in the sections of the *Calendar* devoted to those faculties and schools.

Cancellation of Classes

The University of British Columbia accepts no responsibility for the cancellation or discontinuance of any class or course of instruction which may be made necessary or desirable as a result of an act of God, fire, riot, lock-out, stoppage of work or slow-down, labour disturbances, lack of funds, the operation of law or other causes of the kind.

Change of Registration

Except in special circumstances, a one-term course may be added or dropped from a student's program only within the first two weeks of the course, and a two-term course within the first three weeks. If a course is dropped during these periods, no record of the registration in the course will appear on the student's academic record.

Students may withdraw from courses in which they are registered at any time up to the end of the sixth week of class for courses which are offered in a single term, and of the twelfth week for courses which span two terms, *subject to approval by the appropriate faculty or school*. Withdrawals will be noted on the academic record by a standing of "W". Such standings will not be included in computing averages. The effective dates for 1995/96 are:

Tuesday, September 19, 1995	Last date for withdrawal from a Term I course with no "W" notation appearing on the academic record.
Friday, September 22, 1995	Last date for withdrawal from a two-term course with no "W" notation appearing on the academic record.
Friday, October 13, 1995	Last date for withdrawal from a Term I course with a standing of "W" noted on the academic record. After this date withdrawal is not permitted and students will be graded on the basis of whatever they have done in the course. Students who do not attend but remain registered and neglect to withdraw during the withdrawal period will normally find an "F" standing on their academic record.
Friday, November 24, 1995	Last date for withdrawal from a two-term course with a standing of "W" noted on the academic record.

Tuesday, January 16, 1996	Last date for withdrawal from a Term 2 course with no "W" notation appearing on the academic record.
Friday, February 9, 1996	Last date for withdrawal from a Term 2 course with a standing of "W" noted on the academic record.

Fee refunds for withdrawals will be calculated on a pro-rata basis. (See Fees, Item 16, "Refund of Fees".)

The dates for withdrawal given above also apply to students auditing courses.

Students may withdraw from courses outside the limits described above only with the permission of the Dean of the Faculty in which they are registered. In such cases, the instructor should be informed. Such withdrawals will be recorded as "W" on the student's academic record.

Faculties may, at their discretion, limit the number of "W" standings permitted to a student. Any withdrawals in excess of that limit that would normally produce a standing of "W" will result in assignment of "F" for the course or courses involved. Normally, a student may not withdraw from a course more than once.

A student must be registered in all courses being taken for credit. A student who ceases to attend a course, does not write the final examination, or otherwise fails to complete course requirements, and who neither qualifies for a deferred examination (see information on Deferred Standing under "Grading Practices" below), nor has obtained official permission to drop the course, will be given a standing of "F" with a grade which reflects performance in the course. No supplemental examination can be granted under these circumstances.

The student is responsible for the completeness and accuracy of registration as it relates to the regulations of the degree or diploma program in which the student is enrolled.

Degree or Program Requirements

Degree or program requirements are established and modified with the knowledge and approval of Senate and are recorded in the *Calendar* under the appropriate listing. Unless a student takes an extraordinary number of years to complete prescribed studies, the student is usually given the option of meeting requirements in effect when first enrolled or of meeting revised requirements subsequently approved by Senate.

Interpretation of the requirements will be provided in normal cases by the Dean of the Faculty concerned and where differences occur by the Registrar.

Examinations

Formal examinations are held in most courses in April and in many courses in December.

The holding of any examination, formal or informal, during the two weeks preceding the formally-scheduled examinations of December and April is forbidden. (This **does not apply** to regular weekly or bi-weekly tests or to traditional and current practices in laboratories.)

Other tests are held at the discretion of the instructors and Faculties concerned. All prescribed examinations are mandatory. Students who miss an examination either in December or April because of medical, emotional or other problems should apply as soon as possible to the Dean of their Faculty or the Director of their School for academic concession (see "Academic Concession" above).

Rules Governing Formal Examinations

- 1) Each candidate must be prepared to produce, upon request, a Library/AMS card for identification.
- 2) Candidates are not permitted to ask questions of the invigilators, except in cases of supposed errors or ambiguities in examination-questions.
- 3) No candidate shall be permitted to enter the examination room after the expiration of one-half hour from the scheduled starting time, or to leave during the first half hour of the examination.
- 4) Candidates guilty of any of the following, or similar, dishonest practices shall be immediately dismissed from the examination and shall be liable to disciplinary action.
 - a) Making use of any books, papers or memoranda, calculators, computers, audio or video cassette players or other memory aid devices, other than those authorized by the examiners.
 - b) Speaking or communicating with other candidates.
 - c) Purposely exposing written papers to the view of other candidates. The plea of accident or forgetfulness shall not be received.
- 5) Candidates must not destroy or mutilate any examination material; must hand in all examination papers; and must not take any examination material from the examination room without permission of the invigilator.

Grading Practices

In most Faculties, individual courses are normally graded as follows:

Percent	Letter Grade
90-100	A+
85-89	A
80-84	A-
76-79	B+
72-75	B
68-71	B-
64-67	C+
60-63	C
55-59	C-
50-54	D
0-49	F

If a student in a baccalaureate program who receives a "T" standing in a graduating essay or other course approved by the Faculty completes the course within 12 months of the end of the term in which the student first registered for the course the "T" standing will be replaced by the grade assigned. If the course is not completed within 12 months the "T" standing will be replaced by a grade of zero (or "F" standing in a Pass/Fail course).

The Faculties of Dentistry, Medicine and Graduate Studies and the Schools of Library and Archival Studies, Nursing, and Rehabilitation Sciences, define Fail ("F") as below 60%. Some courses are graded as "P" (requirements of subject completed satisfactorily, no quality grade assigned) or ("F"); such courses are excluded from the calculation of averages. Some Faculties indicate degree standing on graduation based on the average for the degree as follows: Class I, 80% or over; Class II, 65% to 79%; Pass, 50% to 64%.

Faculties, Departments and Schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, Faculty, Department or School norms. Students should therefore note that an unofficial grade given by an instructor might be changed by the Faculty, Department or School. Grades are not official until they appear on a student's transcript.

A few programs of study make provision for an "honours standing", and where this is done it is explained in the

Calendar material of the particular Faculty. However, in most Faculties where "honours" is used it is applied to a study program where expectations in terms of achievement and level of study are higher than in other programs.

Aegrotat standing (**AEG**) allows a student credit for a course even though the course requirements have not been completed due to medical, emotional or other difficulties. This standing is awarded only if the course instructor and the Dean agree that the student has demonstrated the capacity to deal with the course material satisfactorily. When AEG standing is awarded, a letter grade is assigned. This will be converted to the minimum percentage for that category for the calculation of averages.

Deferred Standing (**SD**) may be granted when a student has a valid reason for not completing course requirements as scheduled and does not qualify for Aegrotat standing. Students granted Deferred Standing in Winter Session courses **must complete** all outstanding course requirements by August 25 following. Students granted Deferred Standing in Summer Session courses must complete all outstanding work by December 25 following. Students granted Deferred Standing are responsible for making satisfactory arrangements with their instructors for completion of outstanding course requirements. If a student fails to complete deferred requirements by the dates specified, the Deferred Standing will be replaced with a grade or standing that reflects requirements completed in the course. Students unable to meet the specified deadlines because of further medical, emotional or other difficulties **must** make an additional application for Academic Concession no later than August 31 for Winter Session courses or December 31 for Summer Session courses following the original deferral.

Examination Results

The results of final examinations (including supplementals) are considered confidential until they have been approved by the Faculty or School concerned and released by the Registrar.

Results of the final examinations in Winter Session, Terms 1 and 2, Summer Session and Guided Independent Study courses are available to students by calling the Student Information System number, (604) 280-8228.

Results of the final examinations in April are mailed to students in the graduating classes by the time of Convocation, 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.

Results of final examinations in Summer Session and Guided Independent Study courses are mailed to students as soon as possible after they are approved.

Supplemental Examinations

Supplemental examinations regulations vary among Faculties and are described in the Faculty/School sections of the *Calendar*. Students are governed by the regulations of the Faculty or School in which they are registered.

Supplemental examinations are not available in all Faculties or in all courses. In courses in which proficiency is judged on a continuing basis throughout a term, or in which final examinations are not given, or in Commerce and Pharmaceutical Sciences courses where the final examination contributes less than 40% of the course grade, no supplemental examinations are provided.

Supplemental examinations are not granted to students registered in a graduate program. However, a course in

which a grade of less than 65% was obtained may be repeated for a higher standing if recommended by the Department and approved by the Dean of Graduate Studies. In a course that is repeated, both marks will appear on the transcript. The higher mark will be used to determine promotion in a program and in any decision to admit a student or withdraw a student from a program. Averages calculated for other purposes will include both marks.

Where a supplemental examination is provided a student may write it in an attempt to obtain "higher standing" in the course concerned. The result of the supplemental examination will be shown on the student's record as an additional entry. In some situations a higher mark may enhance a student's chance of meeting some specific program requirement.

In a Guided Independent Study course a supplemental will normally be granted if the student obtains a final standing of not less than 40%.

In the Summer Session a student who satisfactorily completes a six-credit course will be granted a supplemental examination in a second subject if the final mark is not less than 40% in the second subject.

In all but the Final Year a candidate who has been granted a supplemental may write it once only. If the candidate fails, the course must be repeated or a permissible substitute taken. Normally in the Final Year a second supplemental examination may be written.

Supplemental examinations will be held in late July or early August. Applications must be made to the Registrar's Office by June 23, 1995 and must be accompanied by the required fee.

Supplemental examinations may be written at the University and at standard centres* in Campbell River, Chilliwack, Cranbrook, Dawson Creek, Kamloops, Kelowna, Nanaimo, Nelson, Penticton, Port Alberni, Powell River, Prince George, Prince Rupert, Vernon, Victoria, Whitehorse, YT and Williams Lake (*list subject to change).

In special cases a student may be permitted to write supplemental examinations at a university outside British Columbia or at a special centre other than a university if satisfactory arrangements can be made. Since permission is contingent on completion of arrangements, only early applications to write in special centres will be considered.

In the event that a candidate is unable to write an examination, a refund of the required fee will be considered if the candidate submits an adequate explanation to the Registrar prior to the scheduled examination period.

If a supplemental examination is not written by the end of the next regular supplemental examination period for that session, the supplemental standing will be removed.

If a student, because of exceptional circumstances, is permitted to postpone a supplemental beyond the first regular supplemental examination period the student will be responsible for the content of the course as currently offered. If the course is discontinued, the supplemental privilege may be cancelled.

Viewing Marked Examinations

A final examination becomes the property of the University and must remain in the possession of the University until destroyed or otherwise disposed of. No later than one month from receipt of end of session results a student may make written application to the Department Head, Director or Dean, who will make every effort to arrange for the student to view her or his marked final examination paper(s) with the course instructor or design-

nate. The purpose of this exercise is purely pedagogic and distinct from the "review of assigned standing".

Graduation

Every candidate for a degree must make formal application for graduation. Application for graduation must be made not later than **February 15** for graduation in May and not later than **August 15** for graduation in the Fall. Special forms for this purpose are provided by the Registrar's Office.

Students are reminded that, because of the extended Winter Session in the Faculty of Medicine, academic results for the First Year are not available from this Faculty in time for Spring graduation. Thus, all applications for degrees by students completing their Science degrees while registered in the First Year of Medicine, will be treated by the Faculty of Science as applications for Fall graduation.

Students completing degree requirements at another institution are also reminded that, because of the delay in obtaining official transcripts, all applications for degrees for such students will be treated by the Registrar's Office as applications for Fall graduation.

No student will be allowed to graduate until all academic fees have been fully paid.

Letter of Permission

After the start of the first session to which a student has been admitted any student who is eligible to continue studies and who intends to complete a UBC degree may obtain transfer credit from another institution only if prior permission has been obtained from the Faculty in which the student is enrolled.

Retention of Student Records

Academic Records, including all information appearing on a Transcript of Academic Record, are retained indefinitely. Notations of student discipline are retained according to the terms of the penalty imposed. Materials supporting applications for admission, correspondence and transcripts from other institutions and similar material may be destroyed five years after a student's last registration, except for doctoral students where material may be destroyed after two years from the date of graduation. Other material may be destroyed sooner.

Students who submit irreplaceable material may request the return of that material. Such requests must be submitted with the original material. The office to which the material is submitted will return the material as soon as possible and not later than six months after the student's graduation or last registration.

Review of Assigned Standing

Reviews of assigned standing are governed by the following regulations:

- 1) Any request for the review of an assigned grade other than for a supplemental examination (in which a request for a review will not be granted), must reach the Registrar within four weeks after the announcement of final results (for the Winter Session not later than July 15) and must be accompanied by the necessary fee for each course concerned which will be refunded only if the mark is raised.

- 2) Each applicant for a review must state clearly why he or she believes the course deserves a grade higher than it received; pleas on compassionate grounds should not form part of this statement. Prospective applicants should remember that under Senate regulations instructors must re-examine all failing grades and indicate in their records that this has been done.
- 3) An applicant who has been granted a supplemental should prepare for the examination since a change in the original mark is unlikely and the result of the review may not be available before the end of the supplemental examination period.
- 4) Reviews will not be permitted in more than two courses in the work of one academic year, and in one course in a partial program of 18 credits or fewer or in the work of Term 1 or 2 of a Summer Session.

Senate Appeals on Academic Standing

Appeal Procedure

Students who wish to protest decisions relating to their academic studies may do so. The protest should be made initially as near the source of difficulty as possible, presumably an instructor, and progress to the Head of the Department concerned and then to the Dean of the Faculty. There is a standing committee of the University Senate, the Committee on Appeals on Academic Standing, that reviews all appeals made to the Senate which is the senior academic authority in the University. Following are the policies and procedures of this Committee:

1) Composition of the Committee

1.01 The Committee consists of eleven members, six of whom are members of Senate who are faculty members, three of whom are members of Senate who are students, and two of whom are members of Senate who are neither faculty members nor students. The Chancellor, the President and the Registrar are members of the Committee ex officio; the Chancellor and the President, but not the Registrar, shall be entitled to vote.

2) Terms of Reference

2.01 (1) The Committee shall hear and dispose of appeals by students from decisions of Faculties on matters of Academic standing, but the Committee has no jurisdiction where the sole question raised in an appeal turns on the exercise of academic judgement by a Faculty.

2.01 (2) Not only in this part, but in these regulations generally, a "Faculty" shall be deemed to include, where necessary, any other appropriate administrative unit of the University, and "Dean of the Faculty" shall be deemed to refer, where necessary, to any other appropriate officer of the University.

2.02 (1) Subject to (2) of this paragraph, the decision of the Committee on an appeal is a final disposition of that appeal. Senate has conferred on the Committee the power of making final decisions pursuant to Section 36(b) of the University Act.

2.02 (2) If an issue on an appeal raises, in the opinion of the Committee, an unsettled question of policy or procedure of general importance to the University, the Committee may refer that question to the Senate for a ruling.

2.03 (1) The Committee shall allow an appeal where it decides that the decision has been arrived at through improper or unfair procedures, and that as a result a wrong decision on the merits has or may have been arrived at. Without limiting the generality of the phrase

"improper or unfair procedures" it shall be construed to include the consideration of information which ought not to have been considered, and the failure to consider information that ought properly to have been considered.

2.03 (2) "Allow an Appeal" means such one of the following as the Committee deems appropriate in any given case:

- a) A reversal of the decision of the Faculty, and the granting of such academic standing to the appellant as the Committee thinks fit in the circumstances; or
- b) A quashing of the decision of the Faculty, and the sending of the matter back to the Faculty to be dealt with in accordance with proper procedures.

2.04 (1) In all cases other than those falling within paragraph 2.03 the Committee shall dismiss the appeal.

2.04 (2) "Dismiss the Appeal" means to decide that the decision being appealed from is confirmed.

2.05 In order to ensure that an appeal is fairly conducted, the Committee may in any particular case waive any of the procedural rules provided for in these regulations, or may make such further ancillary rulings on procedure as it sees fit.

2.06 Members of the Committee will not discuss the substance of an appeal with any of the parties other than at a hearing.

2.07 The Committee shall make annual reports to Senate. The report shall state the number of appeals heard, their disposition, and the general nature of the appeals, and shall draw Senate's attention to any other matters of general significance in the University which have arisen out of the Committee's work.

3) Procedures Prior to the Hearing

3.01 A student who wishes to appeal a decision of a Faculty shall lodge a written notice of appeal with the Registrar within 10 days of being informed in writing of the Faculty's final decision.

3.02 Within 5 days of receiving a notice of appeal, the Registrar shall send to the appellant a copy of these regulations, and in addition shall inform the appellant that he or she is entitled to appear before the Committee in person and may also be represented by counsel.

3.03 Within 15 days of receiving the regulations, the appellant shall file with the Registrar a statement of appeal. This should contain:

- a) A statement of the decision from which the appeal is being taken;
- b) A statement of the relief which the appellant seeks;
- c) A brief chronological statement of the circumstances relating to the appeal;
- d) Copies of any documents which the appellant intends to rely on at the hearing;
- e) The names of any witnesses the appellant proposes to call at the hearing. It is the appellant's responsibility to ensure that such witnesses are present at the hearing.

3.04 Within 5 days of its receipt the Registrar shall send the appellant's statement of appeal to the Dean of the Faculty from which the appeal is being taken.

3.05 Within 15 days of the receipt from the Registrar of the appellant's statement of appeal, the Dean shall file a response with the Registrar. This should contain:

- a) A confirmation of the nature of the decision from which the student is appealing or, if the decision is not properly stated in the appellant's statement of appeal, a statement as to the nature of the decision;

- b) A statement whether, assuming the appeal were to be allowed, the relief sought by the student ought properly to be granted;

- c) The Faculty's response to the grounds of appeal;
- d) The Faculty's comments on the chronological statements of events;
- e) Copies of any documents which the Faculty intends to rely on at the hearings;
- f) The names of any witnesses the Faculty proposes to call at the hearing.

3.06 Within 10 days of the receipt of the Faculty's response, the Registrar shall set a date for a hearing. The hearing should usually take place within two months of the receipt of the Faculty's response.

3.07 Prior to the hearing the Registrar shall circulate copies of material submitted by the appellant and the Faculty to the members of the Committee, the appellant and the Faculty.

3.08 The time limits referred to in paragraphs 3.01-3.06 are intended as outside limits, and all parties are encouraged to make every effort to proceed more quickly if possible.

3.09 Not only in this part, but in these regulations generally, a reference to a number of days shall not be construed as including Saturdays and Sundays and any other days on which the University is closed.

3.10 The Registrar may, of his own volition or at the request of the appellant or the Faculty, extend the time limits provided for in these regulations. If the Registrar refuses to extend the time limits on the request of the appellant or the Faculty, his decision may be appealed to the Committee as a whole, and the Committee may, acting pursuant to its authority under Paragraph 2.05, extend the time limits as it sees fit.

3.11 The Senate Committee may, at its discretion, dismiss an appeal for lack of prosecution.

4) Procedures at the Hearing

4.01 A quorum for any hearing before the Committee shall consist of at least five voting members, or any lesser number if that is agreed to by the appellant and the Faculty.

4.02 A member of the Committee shall not take part in an appeal where to do so would involve the member of the Committee in a conflict of duty and interest.

4.03 At the hearing, subject to the rulings of the Committee, the following procedure should be followed:

- a) The appellant may make an opening statement;
- b) The appellant may call and examine such witnesses as the appellant sees fit;
- c) The Faculty may cross-examine any of the witnesses called by the appellant, including, where appropriate, the appellant;
- d) The Faculty may make such opening statement as it sees fit;
- e) The Faculty may call and examine such witnesses as it sees fit;
- f) The student may cross-examine any of the Faculty's witnesses;
- g) The appellant may make a closing statement;
- h) The Faculty may make a closing statement;
- i) The appellant may respond to any matters arising out of the Faculty's statement to which the appellant has not yet spoken.

4.04 The Committee may request that it be provided with further information other than that supplied initially by the appellant or the Faculty. Without limiting this general power if, after a hearing, the Committee is of the opinion that it requires further information in order to reach a decision it may either ask that that information be supplied at a further hearing or, without a hearing, it may ask that the information be supplied to it in writing. In the latter case both the appellant and the Faculty must be given the opportunity of commenting on the information so supplied before the Committee reaches a final decision.

5) The Decision

5.01 The Committee may arrive at a decision on the basis of a majority vote of those voting members of the Committee present at the hearing.

5.02 In the event of a tie vote an appeal shall be dismissed.

5.03 The decision of the Committee shall be communicated in writing to the appellant and to the Dean of the Faculty within 10 days of the final hearing of the appeal.

5.04 The Committee shall give reasons for its decision; and in the case of a minority vote, the minority may if it wishes give reasons for its dissent.

Space in Courses

Enrolment is limited in all courses and admission does not guarantee that space will be available in any course or section. However no student in a graduating year may be excluded from a course necessary to meet degree program requirements because of lack of space (this rule does not apply to elective courses or preferred sections of courses). Any student in a graduating year who is confronted with such a situation should consult the Dean, Director, Department Head or Faculty adviser.

Student Discipline

The President of the University has the right under the *University Act* (Section 58) to take whatever disciplinary action is deemed to be warranted by a student's misconduct. The specific provisions as to Offences, Penalties and Procedures which are set out below should not be construed as limiting the general authority of the President under the *University Act*.

Offences

Misconduct subject to penalty includes, but is not limited to, the following offences:

1) Plagiarism

Plagiarism is a form of academic misconduct in which an individual submits or presents the work of another person as his or her own. Scholarship quite properly rests upon examining and referring to the thoughts and writings of others. However, when excerpts are used in paragraphs or essays, the author must be acknowledged through footnotes or other accepted practices.

Substantial plagiarism exists when there is no recognition given to the author for phrases, sentences, and ideas of the author incorporated in an essay.

Complete plagiarism exists when an entire essay is copied from an author, or composed by another person, and presented as original work.

(Students in doubt as to what constitutes a case of plagiarism should consult their instructor.)

- 2) Submitting the same essay, presentation, or assignment more than once whether the earlier submission was at this or another institution, unless prior approval has been obtained.
- 3) Cheating on an examination or falsifying material subject to academic evaluation. Cheating includes, inter alia, having in an examination any materials other than those authorized by the examiners.
- 4) Impersonating a candidate at an examination or availing oneself of the results of such impersonation.
- 5) Submitting false records or information, in writing or orally, or failing to provide relevant information when requested.
- 6) Falsifying or submitting false documents, transcripts or other academic credentials.
- 7) Disrupting instructional activities, including making it difficult to proceed with scheduled lectures, seminars, etc., and with examinations and tests.
- 8) Damaging, removing, or making unauthorized use of University property, or the personal property of faculty, staff, students or others at the University. Without restricting the generality of the meaning of "property" it includes information, however it be recorded or stored.
- 9) Assaulting individuals, including conduct which leads to the physical or emotional injury of faculty, staff, students, or others at the University, or which threatens the physical or emotional well-being of faculty, staff, students, or others at the University.
- 10) Attempting to engage in or assisting others to engage in or attempt to engage in conduct in respect of which disciplinary action may be taken.
- 11) Failing to comply with any penalty imposed for misconduct.

Penalties

The penalties which may be imposed, singly or in combination, for any of the above offences may include, but are not limited to, the following:

- 1) A failing grade or mark of zero in the course, examination, or assignment in which the academic misconduct occurred.
- 2) Suspension from the University for a specified period of time, or indefinitely.
- 3) Reprimand, with letter placed in student's file.
- 4) Restitution in the case of damage to, or removal or unauthorized use of, property.
- 5) A notation on the student's permanent record of the penalty imposed.

Warning

- 1) The penalty for substantial or complete plagiarism, or for cheating, normally is suspension from the University.
- 2) The laying of charges under federal or provincial legislation, or the commencement of civil proceedings, does not preclude disciplinary measures being taken by the University.

Procedures

Section 58 of the *University Act* gives the President of the University the power to suspend students and to deal summarily with any matter of student discipline. To advise him on measures to be taken, the President has established the President's Advisory Committee on Student Discipline. An alleged instance of student misconduct deemed serious enough for action by the President shall be referred to this Committee. After an investigation and a hearing at which the student is invited to appear, the

Committee reports to the President. The student then has the opportunity to meet with the President, if he or she wishes, before the President arrives at a decision.

A student suspected or apprehended in the commission of an offence shall be notified within a reasonable period of time of intention to report the alleged offence to the department head, dean, or other appropriate person. The student shall also be given the opportunity to explain the incident and, if he or she requests, to meet with the department head, dean, or other appropriate person, before the alleged offence is reported to the President.

Appeals

A student has the right to appeal the decision of the President to the Senate Committee on Student Appeals on Academic Discipline.

A student who wishes to appeal the decision of the President must notify the University Registrar in writing and must provide a full explanation of the reasons for appealing.

Appeal hearings are relatively informal. They take place before several members of the University Senate. A student is entitled to be represented or assisted throughout the appeal process by an advocate who may be a friend, a relative or legal counsel. The student is entitled to explain the reasons for appealing either orally or in writing, and may call witnesses. The President is represented by his representative who presents the reasons for the President's decision.

The members of the Committee may ask questions of both the student and the President's representative. As soon as possible after the hearing is completed, the Committee will notify the student of its decision in writing.

Teaching Evaluation

The University recognizes the importance of high quality teaching for the academic preparation of its students and accordingly requires that instructors be annually evaluated by procedures which include provision for assessments by students.

Transcript of Academic Record

An official transcript of a student's academic record will, on written request of the student, be mailed directly to the institution or agency indicated in the request or given to the student in a sealed envelope carrying the inscription "Official transcript enclosed. Invalid if envelope presented with seal broken". Third-party requests must be accompanied by a signed authorization from the student.

Each transcript will include the student's complete record at The University of British Columbia. Since credit earned is determined on the results of final examinations, a transcript will not include results of midterm examinations.

Students' 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 Department of Financial Services to meet any outstanding indebtedness.

Application for a transcript should be made at least one week before the document is required. Fees for transcripts are payable in advance; transcripts will not be provided until payment is received (see the *Calendar* entry, Fees, item 27, "Special Fees, Transcript of Academic Record").

Note: To avoid line-ups, students are encouraged to order transcripts as early as possible. Transcripts may be requested up to six months in advance of a due date. Students may order transcripts via the Student Access Kiosks located outside of the Registrar's Office.

Withdrawal

When TELEREG is available undergraduate students may withdraw from the university by using TELEREG to withdraw from all courses. In all other cases a student who wishes to withdraw from the University must obtain the approval of the Dean, Director or Faculty Adviser on a "Change of Registration" form. When the withdrawal is approved the academic record will show the date of withdrawal and a standing of "W" in all courses that are not completed on that date. When the withdrawal is not approved the student will remain registered in all courses and a final grade and/or standing will be assigned at the end of the term or session. Unclassified students who wish to withdraw should apply to the Registrar's Office. A student who does not complete formal withdrawal procedures will be liable for all assessed fees until such procedures are completed.

Withdrawal for Unsatisfactory Conduct

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 a program 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.

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Office of Guided Independent Study

This office is responsible for the administration of degree credit courses offered through guided independent study (distance education) and is UBC's representative in the universities consortium through the Open Learning Agency.

Full university degree credit may be obtained in a number of fields by guided independent study courses and other forms of independent study. Some faculties have established credit limits for the number of independent study courses which may be applied to a degree program. In general, a student may complete one-third to one-half of a degree program through such study. Students are advised to enquire at the Office of the Dean of the appropriate faculty before undertaking an extensive program of independent study.

Many courses have up to six sessional offerings each year. Standards in the final examinations and notations on academic records are the same as those for regular students. Except in special cases, students may repeat a course only once.

Office of Extra-Sessional Studies

This office is responsible for the administration of degree credit courses offered during the evening Winter Session; all courses offered during the Summer Session; and Directed Study Abroad.

Summer Session

The Summer Calendar is issued in February by the Office of Extra-Sessional Studies, and is available upon request from this office or the Registrar's Office.

Exchange Programs

Opportunities are available for the exchange of graduate and undergraduate students with other universities, through the following Senate-approved exchange programs.

Education Abroad Programs (EAP)

Education Abroad Programs are reciprocal exchange programs based on institution-to-institution agreements with partner universities. UBC students selected to participate remain registered at UBC, pay tuition and student fees to UBC and remain eligible for UBC awards, scholarships and financial aid. Students pursue academic programs which are planned in consultation with their Faculties.

To be eligible to participate in these programs, applicants must be registered at UBC and have at least a 70% average for all courses completed for credit toward their current degree program. Undergraduate students are normally eligible to study abroad in third year only. Graduate students are limited to 12 transfer credits from another institution. Students who have already transferred credits from another institution towards their UBC degree must obtain written confirmation from their Faculties of their eligibility for further transfer credit.

Information Sessions are held throughout the first term and during the month of January. Information materials such as academic calendars are located in the International Opportunities Area of the Student Resources Centre, Brock Hall.

This list is accurate at the time of printing, but there may be more exchange agreements under development. Ap-

Alternative Study Options

plication forms and information may be obtained from the Student Exchange Programs Office, Registrar's Office. The deadline date for EAP applications is the last day of January.

UBC students participating in the exchange program must register in the non-credit activity "Exchange Programs" at The University of British Columbia in each term of study in which they are studying away from UBC.

The Faculty of Commerce and Business Administration Exchange Programs

Students registered in the Faculty of Commerce and Business Administration are eligible to participate in the exchange programs with the following institutions (further information can be obtained from the Commerce Study Abroad and Exchange Office located in Room 102 in the Henry Angus Building):

Australia:	Australian Graduate School of Management University of New South Wales
Austria	Wirtschaftsuniversität Wien
Belgium:	Université Catholique de Louvain
Brazil	Escola de Administração de Empresas de São Paulo da Fundação Getúlio Vargas
Canada	École des Hautes Etudes Commerciales, Montréal
Denmark	Copenhagen Business School
France	Hautes Etudes Commerciales, France
Hong Kong	Chinese University of Hong Kong Hong Kong University of Science and Technology
Italy	Università Commerciale Luigi Bocconi
Japan	Osaka University University of Tokyo
Korea	Korea University
Netherlands	Erasmus University
Norway	Norwegian School of Economics and Business Administration
Singapore	National University of Singapore
Spain	Escuela Superior de Administración y Dirección de Empresas (ESADE)
Sweden	Stockholm School of Economics
Switzerland	Hochschule St. Gallen
Thailand	Thammasat University
United Kingdom	Lancaster University London Business School Manchester Business School European Business Management School University of Wales, Swansea

Canadian Exchange Programs

There are two consortium agreements under which students may apply to study at another Canadian university as an exchange student. The purpose of these exchanges is to encourage students to experience cultural and academic life in a different region of Canada. UBC students who are selected to participate in these programs remain registered at UBC, pay tuition and student fees to UBC

and remain eligible for UBC awards, scholarships and financial aid. Students pursue academic programs which are planned in consultation with their faculties.

Students must register in the appropriate non-credit activity (GOTSEP or CUSEC) at The University of British Columbia in each term of study in which they are studying away from UBC.

Eligibility requirements are the same as for EAP programs.

Group of Ten Student Exchange Program (GOTSEP)

This is an institution-to-institution agreement in which UBC participates with nine other universities.

Interested students should contact the Student Exchange Programs office for more information. The deadline for GOTSEP applications is the last day of January.

Canadian Universities Student Exchange Consortium (CUSEC)

This is a larger consortium agreement which links UBC with 27 universities across Canada. Exchange agreements are negotiated and administered by individual departments.

Information regarding these exchange programs is available from participating UBC departments. Calendars are available in the Student Counselling Resource Centre, Brock Hall. At the time of publication, an agreement exists between the program of Landscape Architecture at UBC and the Departments of Landscape Architecture at the University of Guelph.

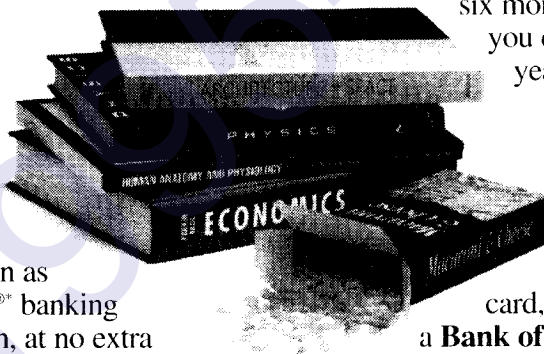
Programs not sponsored by The University of British Columbia

Many students choose to attend study programs sponsored by institutions and organizations other than UBC. These students must make all necessary arrangements on their own. There is an International Opportunities Area in the Student Resources Centre, Brock Hall, where students can research options to study, work, or volunteer. Before enrolling in any program, students should consult faculty advisers concerning the transferability of course work, degree requirements and procedures for readmission. Students planning to obtain transfer credit must obtain a Letter of Permission from the Faculty in which they are enrolled before leaving UBC (see Transfer policy: Letter of Permission).

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

1) The University reserves the right to change fees without notice.

Note: The fees shown below had not received final approval from the Board of Governors when the *Calendar* was printed. Any changes in the fees approved for 1995/96 or the policy for increasing fees for 1996/97 will be included in the electronic version of the *Calendar* on ViewUBC (on the Internet, Gopher address: view.ubc.ca port 70; World Wide Web address: http://view.ubc.ca) when they are approved.

Increases in tuition fees will be equal to the annual percentage increase in the Vancouver Consumer Price Index for the preceding year plus 1.5% in 1994/95, 4% in 1995/96 and 3.5% in 1996/97. Of the total increase, 1.5% will be allocated to the Student Aid Fund in each of 1994/95 and 1995/96; 1.0% will be allocated in 1996/97. In addition, and again of the total increase, 1.0% will be allocated to the Teaching and Learning Enhancement Fund in each of the next three years. The maximum number of credits used in calculating per credit fees for the Winter Session in most undergraduate programs (see item 6) will be 46 credits in 1995/96. There will be no maximum in following years. Increases are effective September 1 in each year.

Students who have not completed their course requirements when a change in fees is made will be affected by the change.

A student upon registering has initiated a contract with the University for payment of assessed fees. A student may terminate this contract only by withdrawing from the University (see item 4, "Minimum Payment", item 16, "Refund of Fees", and "Withdrawal" in the Academic Regulations section).

2) Payment

Fees may be paid by the following methods:

- **by touch tone telephone** – Currently available to students banking with most B.C. credit unions, Canada Trust, TD Bank, CIBC and Bank of Montreal. Please contact your branch for details.
- **at any branch of the Bank of Montreal** – (a) Students who have an account with the Bank of Montreal can pay tuition fees via a bank machine by using the bill payment option. (b) Students who do not have an account with the Bank of Montreal can pay their fees at the customer service counter. **A tuition fee payment form must be completed for all payments made either at a bank machine or at the counter.**
- **by mail** – Cheques should be made payable to "The University of British Columbia" and must reach UBC Financial Services by the due date.

Tuition fees, student fees and other approved fees are consolidated in a Student Financial Account. The outstanding balance in this account will reflect outstanding amounts from previous sessions, changes in registration, any awards made to the student (or the cancellation of an award), penalties for late payment and other approved charges as well as payments made by the student. **It is the responsibility of students to make their payments by the due dates. Students should check their outstanding balance by calling UBC's Student Information System at 280-8228. Payments are applied first to amounts with the earliest due date.**

3) Due Dates

The due date is Wednesday of the first week of classes for Winter Session Term 1, January 7 in Term 2, and May 7 in

Fees

Summer Session (July 7 for courses and programs starting in Term 2 of Summer Session). The **due date** for any increase in a student's balance resulting from an assessment during a term is the seventh of the next month.

When the due date falls on a Saturday, Sunday or statutory holiday payment may be made on the next business day.

4) Minimum Payments

To avoid cancellation of registration:

Undergraduate students must pay the following minimum amounts (see the *Registration Guide* or *Summer Session Calendar* for specific dates):

- a) when registering two weeks or more before the start of a term: a non-refundable deposit of \$100 is required within 14 days of registration; full payment of the first instalment of fees is required by the due date in Term 1.
- b) when registering during the last two weeks before the start of a term: full payment of the first instalment of fees is required by the due date.

Graduate Students must pay the full amount of the first instalment of fees by the due date in the term in which they first register.

Note: Certain programs require students to indicate their acceptance of an offer of admission by paying a portion of their tuition fee. Students will be notified of this when they are offered admission to the program.

5) Penalties for Non Payment and Overdue Fees

Undergraduate Students

Students who have not paid at least the minimum payment by the due date (see Items 3 and 4) will have their **registration in all courses in the current session cancelled**. Students may re-register within the period allowed for adding courses subject to the availability of space. Students who have not paid their outstanding balance in full by the due date but have paid an amount at least equal to the minimum payment (see item 4) will be placed on **financial hold**.

Graduate Students

New graduate students who have not paid the first instalment of fees by the due date will have their **registration cancelled** but will remain eligible to re-register during the current session and may re-register for courses within the period allowed for adding courses subject to the availability of space.

Continuing graduate students who have paid the first instalment of fees in full but have not paid a subsequent outstanding balance in full by the due date will be placed on **financial hold**. If the overdue amount is not paid in full by the first day of the next session their **registration will be terminated** at that time. They will remain liable for the outstanding balance plus all interest assessed up to the date on which the outstanding balance is paid in full. Subsequent registration will only be allowed with the written approval of the Faculty of Graduate Studies. Retroactive fees and interest will be assessed prior to registration and all outstanding fees and interest must be paid at that time.

Financial Hold

When a student has been placed on financial hold, no subsequent registration activity will be allowed, no statement of grades or transcripts of academic record will be issued and the student will not be allowed to graduate. The Awards and Financial Aid Office, the Faculty and the Library will be notified and use of the Library may be restricted. The student will not be eligible to register in any future session until the financial hold is removed. The financial hold will be removed when the outstanding balance, including all interest penalties, is paid in full. In respect of any other indebtedness to the University, subsequent registration may be denied until these accounts are fully paid.

Interest Penalty

Interest will be charged at a rate of 1.5% per month, compounded monthly, which is equivalent to 19.56% per annum. Interest is charged on all outstanding amounts that are past due and is calculated towards the end of each month. **See Item 3 for due dates.**

Late Registration

Fees payable by late registrants will be considered to have been assessed on the starting date of the course or program and to be due seven days later. An interest penalty based on these dates may be assessed.

6) Undergraduate Tuition Fees

Fee payment in the Winter Session may be in two instalments. In general, the first instalment covers tuition for Term 1 courses and the first half of full session courses plus **all** student fees and the second instalment covers tuition for Term 2 courses and the second half of full session courses. Students enrolled in a study program restricted to Term 1 or Term 2 must pay the full amount assessed by the due date for that term.

Fees shown do **not** include student fees nor do they include Laboratory and other Special Fees. See items 10, 11, 12, 13, 14, 26 and 27 for an explanation of these additional amounts.

Per-credit fees

A fee of \$76.50 per credit is charged for all undergraduate diploma, baccalaureate and post-baccalaureate programs **except** those programs in Dentistry, Law, Medicine and Pharmaceutical Sciences shown below. Fees paid for a graduate program do not cover courses being taken to complete the requirements of an undergraduate degree.

Illustration of tuition fees charged

a) 30-credit program at \$76.50 per credit:	
Tuition (30 x \$76.50)	\$ 2,295.00
Student Fees (see Items 11, 12 and 13)	\$ 204.72
Plus applicable student society fee (see Item 14)	\$
	\$ (total)
b) 36-credit program at \$76.50 per credit:	
Tuition (36 x \$76.50)	\$ 2,754.00
Student Fees (see Items 11, 12 and 13)	\$ 204.72
Plus applicable student society fee (see Item 14)	\$
	\$ (total)

Note: Except for students in 12-month programs in the Faculty of Education or students registered in more than one program, the maximum tuition fee payable in the 1995/96 Winter Session by an undergraduate student in a

program for which there is a per-credit fee will be the fee for a 46-credit program, i.e.:

Tuition (46 x \$76.50)	\$ 3,519.00
Student Fees (see Items 11, 12 and 13)	\$ 204.72
Plus applicable student society fee (see Item 14)	\$
	\$ (total)

Program Fees, assessed in two instalments in the Winter Session, are charged for the following programs:

Dentistry	
Doctor of Dental Medicine	\$ 3,937.00 per year
Combined D.M.D. and B.Sc.	\$ 3,937.00 per year
Diploma Program (Periodontics)	\$ 4,473.00 per year
Residents	\$ 286.00 per year
Law (Bachelor of Laws)	
Full time — First year (32 credits)	\$ 3,199.00 per year
— Second year (30 credits)	\$ 2,999.00 per year
— Third year (30 credits)	\$ 2,999.00 per year
Part time — First year	\$ 1,599.50 per year
— Second year	\$ 1,499.50 per year
— Third year	\$ 1,499.50 per year
Medicine	
Doctor of Medicine	\$ 3,937.00 per year
Combined M.D. and B.Sc.	\$ 3,937.00 per year
Residents and Interns	\$ 286.00
Pharmaceutical Sciences	
Residents	\$ 51.75

7) Unclassified Students, Qualifying Students, Auditors and Others

Unclassified students, qualifying students, auditors, students registered for concurrent studies and students not working toward a degree are assessed a fee of \$76.50 per credit for undergraduate courses (normally those numbered under 500). For graduate courses (normally those numbered 500 and above) the fee is \$194.00 per credit.

8) Senior Citizens

B.C. residents who are Canadian citizens or permanent residents aged 65 years or over during the session in which they are registered are not assessed application, tuition or student fees. Some GIS and special fees may be assessed. This does not apply however to programs in areas such as Dentistry, Law, Medicine and Nursing or any faculty or school where existing facilities and resources are limited.

9) International Students

All international students except those registered in the Faculty of Graduate Studies will be assessed tuition fees in the amount of 2.5 times the corresponding tuition fee for Canadian Citizens and Permanent Residents (landed immigrants). Where reciprocity agreements exist, international students shall pay only regular fees.

International students registered in the Faculty of Graduate Studies are assessed fees on the same basis as Canadian citizens and permanent residents.

10) The Graduating Class Fee

A fee of \$7, authorized by the Board of Governors, is assessed for all students in the Winter Session who are registered in the final year of a course leading to a bachelor's or the M.D. or the D.M.D. degree and who have not previously paid the fee. This fee is for the support of student-sponsored graduating class activities. Enquiries with respect to this fee should be directed to the Alma Mater Society.

11) The Student Activity Fee

A fee of \$125.22 is assessed for all students in the Winter Session who are enrolled in a program of 18 credits or more. Students taking fewer than 18 credits will be assessed at \$6.95 per credit. The fee is assessed by the Board

of Governors and is used to support athletic and recreation programs and facilities.

12) Alma Mater Society Fees

These fees are authorized by student referendum and the Board of Governors. They are collected by the university at the request of the Society. Students enrolled in 18 or more credits are assessed fees of \$39.50 made up as follows:

Operating expenses of the AMS	\$ 12.50
Capital projects (CPAC)	15.00
Intramural sports	4.50
Athletic fee (Intercollegiate)	7.00
Refugee students assistance	50
Total	\$ 39.50

Students taking fewer than 18 credits are assessed fees of \$2.25 per credit.

13) Student Recreation Centre

A voluntary contribution of \$40 per year per full-time student will be assessed for a seven year period ending with the 1997/98 Winter Session (see below for opt out procedure). The funds, along with matching funds, will be used to construct a Student Recreation Centre adjacent to the MacInnes Field.

The contribution will be assessed as follows:

Undergraduate students registered for 18 or more credits	\$ 40.00
Undergraduate students registered for fewer than 18 credits	\$ 2.25 per credit
Graduate students	\$ 40.00
Part time graduate students on Payment Schedule B	\$ 20.00

Students who wish to obtain a charitable receipt for income tax purposes may complete a request form during the period of eligibility at the Intramurals Department, Room 66, Student Union Building or should write to the Development Office, 6253 NW Marine Drive, Vancouver, B.C., V6T 1Z1. Requests must include the student name and student number, and be received by December 31.

All students must pay the assessed amount by the due date (see Item 3). Students who wish to opt out of this contribution must apply in person to the Intramurals Department, Room 66, Student Union Building and fill out a form for an assessment adjustment. Adjustments will be credited to the student's tuition account. Students registered in one term of Winter Session or in either term of Summer Session must apply by the end of the second week of classes. Students registered in both terms of the Winter Session must apply by the end of the fourth week of classes in term one and will have adjustments credited to their **second** fee instalment.

14) Undergraduate Society Fees

The Board of Governors approves, on the recommendation of the Alma Mater Society, special fees for Undergraduate Societies. The fees for Winter Session are as follows:

Agriculture (B.Sc. (Agr.))	\$ 30.00
Agriculture (B.L.A.)	\$ 20.00
Architecture	\$ 20.00
Arts (B.A., B.F.A., B.Mus. and Diploma Programs)	\$ 7.00
Commerce (B.Com.)	\$ 8.00
Dentistry	\$ 40.00
Education (including Diploma Programs)	\$ 10.00
Engineering	\$ 35.00
Family and Nutritional Sciences (B.H.E.), B.Sc. (Dietet.)	\$ 7.00
Forestry	\$ 30.00
Human Kinetics	\$ 10.00
Law	\$ 15.00
Medicine	
First and second years	\$ 38.00
Third and fourth years	\$ 48.00

Nursing	\$ 18.50
Pharmacy	\$ 18.00
Rehabilitation Sciences	\$ 6.00
Social Work	\$ 5.00
Science	\$ 10.00

These fees are not related to credit load.

15) Graduate Society Fees

These fees are authorized by student referendum and the Board of Governors. The annual fees are:

Capital Improvement Fund (for 1994/95 and 1995/96)	\$ 5.00
Graduate Student Society	\$ 34.00

16) Refund of Fees

Refund of fees, if any, is calculated from the day on which a student drops or withdraws from a course or program. (See Change of Registration and Withdrawal.) If a withdrawal is not approved, the student will be liable for all assessed fees including any interest penalty. Students must apply to the Department of Financial Services to receive payment.

Undergraduate Students

The first \$100 of tuition fees paid for any session is non-refundable.

a) Refund for two-term courses:

Term 1	
During first three weeks of classes	100% of the first instalment of the fee for credits dropped
During fourth week	60% of the first instalment
During fifth and sixth weeks	40% of the first instalment
During seventh and eighth weeks	20% of the first instalment

After the ninth week of classes there is no refund of any part of the first instalment of tuition fees. The second instalment of fees will not be assessed.

Term 2	
During first two weeks of classes	100% of the second instalment of the fee for credits dropped
During third and fourth weeks	60% of the second instalment
During fifth and sixth weeks	40% of the second instalment
During seventh and eighth weeks	20% of the second instalment

After the eighth week of classes there is no refund of tuition fees for two-term courses.

b) Refund for one-term courses:

During first two weeks of classes	100% of the fee for credits dropped
During third or fourth week	60% of the fee for credits dropped
During fifth or sixth week	40% of the fee for credits dropped
During seventh or eighth week	20% of the fee for credits dropped

Graduate Students

The refund of fees for graduate students who withdraw from either Term 1 or Term 2 of Winter Session or from Summer Session after registration will be calculated as shown below.

During first two weeks of Winter Session	100% of the instalment for that term or session.
	Term 1 or Term 2 or Summer Session:
During third or fourth week	60% of the instalment
During fifth or sixth week	40% of the instalment
During seventh or eighth week	20% of the instalment

After the eighth week there is no refund of any part of the tuition fee instalment.

Student Fees

These include the Student Activity fee, the AMS fees, and any other special fees for undergraduate student societies, facilities or activities.

If a student's sessional credit load drops below 18 credits:

- a) before or during the second week of classes in Term 1; or
- b) before TELEREG closes for Term 2 course changes when Term 2 courses are dropped;

the Student Activity fee and the AMS fees are adjusted based on credit load.

17) Master's Degree Tuition Fees

Every candidate enrolled in a Master's program is required to maintain continuous registration by paying tuition instalments according to Schedule A or B or the schedule for a combined program plus authorized student fees, as listed below. Failure to pay fees will result in the cancellation of registration or a financial hold followed by termination of registration (see Item 5).

All graduate students are automatically assessed fees according to Schedule A. Students who are planning on taking a Master's Degree through part-time study must apply in writing to the Registrar's Office prior to the beginning of the term in which fees are first assessed.

Candidates planning to complete their degree through full-time study must select Schedule A. Only candidates planning to take their degree through part-time study are permitted to select Schedule B. Candidates who change from full-time to part-time study must apply in writing to the Registrar's Office to change from Schedule A to Schedule B. Such a change will normally be allowed retroactive to the date on which part-time study began. The total fees assessed following a change to Schedule B will not normally be less than those already assessed under Schedule A at the time of the change. Any overpayment after the candidate is moved to the new schedule will be applied first to currently assessed fees. **Candidates who select Schedule B are advised that, by virtue of their part-time status they are ineligible to receive government loans, interest-free status and University Fellowships or Scholarships. Candidates are not permitted to switch from Schedule B to Schedule A after the initial payment.**

Schedule A (available to all students)

The normal fee for the full-time Master's degree is the amount paid in six continuous instalments according to the following schedule (plus authorized student fees):

First year total fees	\$ 2,279.00
Instalment No. 1	\$ 759.67
Instalment No. 2	\$ 759.67
Instalment No. 3	\$ 759.66
Second year total fees	\$ 2,279.00
Instalment No. 4	\$ 759.67
Instalment No. 5	\$ 759.67
Instalment No. 6	\$ 759.66

No candidate who selects Schedule A will pay total fees of less than the first three instalments.

Schedule B (available only to part-time students)

The normal fee for the part-time Master's degree is the amount paid in twelve continuous instalments according to the following schedule (plus authorized student fees):

First year total fees	\$ 1,307.00
Instalment No. 1	\$ 135.67
Instalment No. 2	\$ 135.67
Instalment No. 3	\$ 135.66
Second year total fees	\$ 1,307.00
Instalment No. 4	\$ 135.67
Instalment No. 5	\$ 135.67
Instalment No. 6	\$ 135.66
Third year total fees	\$ 1,307.00
Instalment No. 7	\$ 135.67
Instalment No. 8	\$ 135.67
Instalment No. 9	\$ 135.66

Fourth year total fees	\$ 1,307.00
Instalment No. 10	\$ 135.67
Instalment No. 11	\$ 135.67
Instalment No. 12	\$ 135.66

No candidate who selects Schedule B will pay total fees of less than the first nine instalments.

Fees applicable to both Schedules A and B

Each subsequent year, continuing fee	\$ 1,218.00
On Leave fee per year	\$ 269.00
Extension fee per year	\$ 1,711.00

Fees Payable on Completion of Degree

Candidates who have paid more than the minimum for the degree (three instalments on Schedule A or nine on Schedule B) will have their fees prorated to the end of the month in which the Faculty of Graduate Studies confirms that all degree requirements have been completed.

Master of Business Administration Full Time Program

Total fees (15-month Program)*	\$ 7,000.00
Instalment 1	\$ 1,750.00
Instalment 2	\$ 1,750.00
Instalment 3	\$ 1,750.00
Instalment 4	\$ 1,750.00
Each subsequent year, continuing fee	\$ 1,218.00
On Leave fee per year	\$ 269.00

* For students beginning in September 1995. Students registered in the program prior to September 1995 will pay Master's degree tuition fees.

Combined Master's Degree and Diploma in Dentistry

First year	\$ 4,473.00
Second year	\$ 1,173.00
Third year	\$ 2,115.00
Each subsequent year, continuing fee	\$ 1,218.00
On Leave fee per year	\$ 269.00

Should additional clinical studies be required in the third year of the program a further fee of \$1,549.00 will be assessed in the third year.

Combined Master of Business Administration and Bachelor of Laws

First year	\$ 3,050.00
Second year	\$ 2,926.00
Third year	\$ 3,050.00
Fourth year	\$ 2,926.00
Each subsequent year, continuing fee	\$ 1,218.00
On Leave fee per year	\$ 269.00

Student Fees

The annual student fees for students paying according to Schedule A are 100% of those in Items 11, 12, 13 and 15. The annual student fees for students paying according to Schedule B are 50% of those in Items 11, 12 and 13 plus 100% of those in Item 15. The fees are paid in three instalments, along with tuition fees.

There is an additional authorized student fee of \$10.00 for students in Community and Regional Planning, \$5.00 for students in Forestry and \$15.00 for students in Library, Archival and Information Studies. These fees are collected by the student societies.

Graduate students are required to pay student fees regardless of the student's place of residence.

18) Doctoral Degree Tuition Fees

Every candidate enrolled in a Doctoral program is required to maintain continuous registration by paying tuition instalments plus authorized student fees according to the appropriate schedule below. Failure to pay fees will result in the cancellation of registration or a financial hold followed by termination of registration (see Item 5).

All candidates are considered to be "full-time" for the assessment of tuition and authorized student fees. The normal fee for the Doctoral program is paid in nine

continuous instalments according to the following schedule (plus authorized student fees):

First year total fees	\$ 2,279.00
Instalment No. 1	\$ 759.67
Instalment No. 2	\$ 759.67
Instalment No. 3	\$ 759.66
Second year total fees	\$ 2,279.00
Instalment No. 4	\$ 759.67
Instalment No. 5	\$ 759.67
Instalment No. 6	\$ 759.66
Third year total fees	\$ 2,279.00
Instalment No. 7	\$ 759.67
Instalment No. 8	\$ 759.67
Instalment No. 9	\$ 759.66
Each subsequent year, continuing fee	\$ 1,218.00
On Leave fee per year	\$ 269.00
Extension Fee per year	\$ 1,711.00

A student at this University who transfers from a Master's program to the Doctoral program will receive credit toward the fees required for the Doctoral program. Students who were on Master's fee Schedule A will receive credit for one Doctoral instalment for each Master's instalment paid to a maximum of six. Students who were on Master's fee Schedule B will receive credit for up to three Doctoral instalments based on the total fees paid for the Master's program prior to transfer.

No candidate in any Doctoral degree program will pay total fees of less than the first six instalments.

Fees Payable on Completion of Degree

Candidates who have paid more than the minimum for the degree (the first six instalments) will have their fees prorated to the end of the month in which the Faculty of Graduate Studies confirms that all degree requirements have been completed.

Combined Doctor of Philosophy and Doctor of Medicine

First year	\$ 3,937.00
Second year	\$ 2,279.00
Third year	\$ 2,116.00
Fourth year	\$ 3,937.00
Fifth year	\$ 3,937.00
Sixth year	\$ 3,937.00
Each subsequent year, continuing fee	\$ 1,218.00
On leave fee per year	\$ 269.00
Extension Fee per year	\$ 1,711.00

Doctor of Pharmacy

For students beginning in September 1995* \$12,000.00 per year

* Students registered in the program prior to September 1995 will pay doctoral degree tuition fees.

Student fees

The annual student fees are the same as those for full time Master's students.

19) Other Programs

Students in Senate-approved combined degree programs who have completed the full requirements for one of the degrees and who have paid fees at least equal to the normal fee for that degree while in the combined program may apply to receive that degree before completing the combined program.

Students in Senate-approved combined degree programs for which a program fee has not been established will be assessed the higher of the fees for each of the separate programs.

Students registered in more than one degree program, other than a Senate-approved combined degree program, will be assessed fees for each program. Student fees that are common to more than one of the programs will only be assessed once. Students who have paid total tuition fees for a graduate degree or a degree with a program fee equal to the total amount normally assessed

for the degree (excluding continuing, on leave and extension fees) may appeal to the Registrar to have their assessment for that program waived if they are being assessed fees for another program.

20) Qualifying Students

"Qualifying" students will be assessed fees on a per-credit basis for all courses taken (see Item 7). Fees paid under these circumstances will not subsequently be credited in a graduate degree program.

21) Visiting Students

Visiting Undergraduate students will be assessed fees at the prevailing per-credit rate (see items 6 and 9) plus authorized student fees.

Visiting graduate students who wish to take credit courses must register for those courses and will be assessed tuition fees at the prevailing graduate per credit rate, (see Item 7) plus authorized student fees. Other visiting graduate students may register for the non-credit activity "Visiting Graduate Student." The fee for each registration in this activity, which covers either Term 1 of Winter Session, Term 2 of Winter Session or Summer Session, is equal to the tuition fee for one credit of course work plus authorized student fees.

22) Universities Graduate Exchange Agreements

Graduate students in good standing and paying tuition fees at one of the following universities: Alberta, Calgary, Lethbridge, Manitoba, McGill, Northern British Columbia, Regina, Saskatchewan, Simon Fraser, Toronto, or Victoria can register at UBC as exchange graduate students without paying fees. See "Universities Graduate Exchange Agreements" in the Graduate Studies section of the *Calendar*.

23) Undergraduate Formal Exchange Programs

Students visiting UBC on approved exchange programs covered by a formal agreement between their home university and this university pay fees to their home university. These fees cover credit courses taken in the Winter Session.

UBC undergraduate students who are studying elsewhere on approved exchange programs covered by a formal agreement between the two universities (EAP, GOTSEP or CUSEC) must register for the appropriate non-credit exchange activity and pay UBC tuition fees for 15 credits per term plus student fees for the Winter Session. All other UBC students on such exchange programs pay to UBC the normal tuition fees for their program for each term they are away plus student fees.

24) Hospital Insurance

Students from outside the Province of British Columbia must be covered with some form of hospital insurance as a condition of their acceptance to the University. See "The Student Health Service" for details.

25) Summer Session

Tuition fees payable (except Graduate Studies): \$ 76.50 per credit
Auditor regular tuition fee

Summer Session students are assessed a Student Activity fee of \$6.95 per credit, an AMS fee of \$1.00 per credit, and a Student Recreation Centre contribution of \$2.25 per credit. The maximum undergraduate student fees payable for the period September 1 to August 31 are \$39.50 (AMS), \$125.22 Student Activity Fee and \$40.00 Student Recreation Centre Contribution. Students should refer to

the Summer Session *Calendar* for further details on these fees.

26) Guided Independent Study Courses

Fees will be charged on a per-credit basis plus a non-refundable administrative charge of \$15.00 for each Guided Independent Study course.

Refunds will be granted if applied for in writing and received at the Guided Independent Study office by the end of the month of the course start date. Course materials must be returned in new condition. The minimum assessment will be \$100.00 or 20% of the tuition, whichever is greater.

Where examinations are permitted at a location not normally set up for UBC examinations, a Special Invigilation and Outside Examination Centre Fee of \$55.00 is payable with your examination application. The following fees also apply:

Forestry 111 (Section 99A) - additional Laboratory fee	\$ 100.00
Forestry 202 and 203 (Sections 99B) - additional Laboratory fee	\$ 65.00
Forestry 237, 238, 308, 309 (Section 99C) - additional Laboratory fee	\$ 65.00
Forestry 405 (Section 99A) - additional Laboratory fee	\$ 80.00
Nursing 335 (Section 99A) - additional Clinical Tutorial fee	\$ 200.00
Nursing 410 (Section 99C) - additional Clinical Tutorial fee	\$ 225.00
Nursing 411 (Section 98A) - additional Clinical Tutorial fee	\$ 200.00
Nursing 412 (Section 99C)	TBA
Soil Science 200 (Section 99C) - additional Laboratory fee	\$ 65.00

27) Special Fees

Application Processing Fees

For applicants presenting British Columbia documents (including applicants for readmission and/or change of Faculty)	\$ 20.00
For applicants presenting documents from outside B.C.	\$ 30.00

Note: Fees shown are for most undergraduate programs. Some programs have higher or additional fees.

Other Fees

Dishonoured cheque	\$ 15.00
Duplicate tuition fee receipts	\$ 5.00
Special Invigilation and Outside Exam Centre Fee (per paper)	\$ 55.00
Supplemental examination at UBC, per paper	\$ 25.00
Supplemental examination at standard centres, per paper	\$ 30.00
Deferred examination at standard centres, per paper	\$ 20.00
Deferred or supplemental examination at special centres, per paper	\$ 55.00
GIS special examination (where permitted), per paper	\$ 40.00
Review of Assigned Standing, per course	\$ 25.00
Co-operative Education Program, fee per course	\$ 226.75
Education, special tuition fee for M. Ed. programs partially offered outside the Lower Mainland (paid in a minimum of nine instalments)	variable
Dentistry, short-term visiting students	\$ 50.00
Library (replacement cards)	\$ 6.00
B.Sc. (Pharm.) practice fee for students in fourth year (effective September 1995)	\$ 200.00

See also entries under the Faculties of Education, Graduate Studies, Law and Medicine, and the School of Rehabilitation Sciences.

Field Trip Fees

Agricultural Economics 400	\$ 26.00
Agricultural Sciences 500	\$ 233.00
Anthropology 300	variable
Architecture 406	\$ 465.00
Architecture 512 (extra sessional)	\$ 569.00
Biology 205 (optional field trip)	variable
Biology 326 (optional field trip)	variable
Biology 328 (optional field trip)	variable
Biology 409	variable
Biology 426	variable
Biology 427	variable

Biology 428 (optional field trip)	variable
Geography 309 up to	\$ 336.00
Forestry 351 (Interior Field Trip)	\$ 450.00
Forest Operations 352	variable
Forestry 451 (Coast Field Trip)	\$ 545.00
Wood Science and Industry 353	variable
Geology 235	\$ 310.00
Geology 335	\$ 114.00
Landscape Architecture 199 - accommodation, instruction, administration	\$ 200.00
transportation, meals	\$ 150.00 - 350.00

Calendar Fees

The *Calendar* is available for purchase in both printed and CD version for the fees indicated below.

<i>Calendar</i> Fee (\$3.78 plus GST)	\$ 4.00
<i>Calendar</i> sent by mail (including \$3.78 fee and GST):	
Canada	\$ 8.75
U.S.A.	\$ 10.50
Outside Canada (excluding U.S.A.)	\$ 13.50

UBC Calendar on the Internet

The *Calendar* is available online by gopher (hostname is view.ubc.ca, port is 70), or by Mosaic browser pointed at the URL <http://view.ubc.ca>. These addresses will connect the user to the ViewUBC gopher service. The *Calendar* is located under UBC Publications.

Transcript of Academic Record

Official transcripts are normally available for pickup at the Registrar's Office on the next business day after they are ordered. Official transcripts are normally mailed within five working days of ordering. Fees for transcripts are payable in advance.

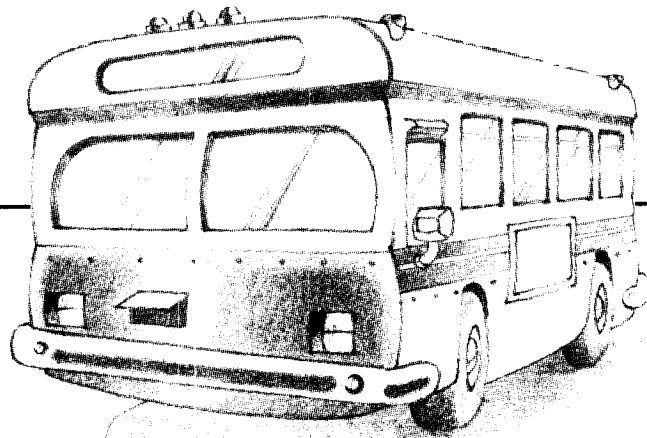
Single copy	\$ 4.00
Additional copies ordered at the same time for printing on the same day, each copy	\$ 2.00
Additional fee for facsimile transmission, each copy	
• in Canada and USA	\$ 5.00
• outside Canada and USA	\$ 10.00
Additional fee for Courier delivery, each copy	
• in Canada	\$ 12.00
• in USA	\$ 18.00
• outside Canada and USA - depends on destination	

TELEREG Transaction Fee

Use of TELEREG is free for the first 50 transactions (entry of student number and session code, fee enquiry, exit and some other commands are not included in this total). There is a fee of \$1 per transaction in excess of 50 to a maximum of \$35. Use of TELEREG is prohibited without special authorization after the \$35 fee has been assessed. Please see the Registration Guide for more details.

Library - Extramural Services

Fees have been authorized for extramural borrowing. Information concerning these fees may be obtained from the Librarian.



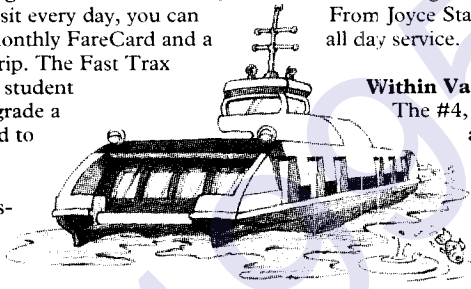
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Your Best Route To Campus

Here is a complete listing of transit service to the UBC campus by area:

From West Vancouver

The #258 operates from Dunderave and Park Royal to UBC during rush hours.

From North Vancouver

The #286 operates from the Highlands area to UBC during rush hours. Or, catch SeaBus to downtown and board the #85 for express service to UBC during the morning rush hour.

From Downtown Vancouver

The #4 on Granville Mall and #10 on Hastings or Granville Mall operate frequently to campus all day. Or from Waterfront SkyTrain Station and Burrard Street, the #85 provides express service during the morning rush hour.

From SkyTrain

From Broadway Station, the #9 provides all day service and the #31 provides express service during the morning rush hour.

From Joyce Station, the #41 provides all day service.

Within Vancouver

The #4, 9, 10, 25, 31, 41, 49 and #85 routes all provide direct service to UBC. (Note: The #10, 31 and #85 operate as express only along portions of their route and boarding locations are limited.)

From Richmond

The #480 provides direct service during rush hours. Or, catch any bus travelling to downtown Vancouver and transfer to the #41 at Granville and 41st Ave.

From Ladner & South Delta

Catch any bus travelling to Vancouver and transfer to the #41 at Granville and 41st Ave.

From North Delta, Surrey, White Rock, Langley, New Westminster & South Burnaby

Catch any bus travelling to SkyTrain and transfer to the #9 or #31 at Broadway Station. Or, from Scottsdale Mall, catch the #311 and transfer to the #41 at Granville and 41st.

From North Burnaby

Catch any local bus travelling to Kootenay Loop and transfer to the #10. Or, catch the #25 from Brentwood Mall.

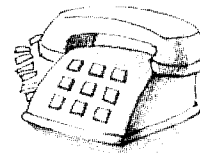
From North Coquitlam, Port Moody, Port Coquitlam, Maple Ridge & Pitt Meadows

Catch any bus travelling to downtown Vancouver and transfer to the #4 or #10 at Granville and Hastings.

Information At Your Fingertips

Here's how to find out when bus service operates to and from the campus:

- Departure times are listed on the bus stops at the University Transit Exchange.
- Schedules are available through UBC's Internet system. 'View UBC' is on-line 7 days a week, and is accessible from any computer that is connected, or can connect to the campus network. Pick up information from Computing & Communications (CSci 100), or e-mail help@ucs.ubc.ca, or call 822-2008.
- Free timetables are available at the student union and many other campus locations.
- Call Talking Yellow Pages at 299-9000, local 2233 for pre-recorded transit information.
- Call BC Transit's Customer Information staff at 521-0400.



BC Transit  Vancouver Regional Transit System

UBC does not endorse any advertiser in this publication.

Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.



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(604) 687-7711 #2887

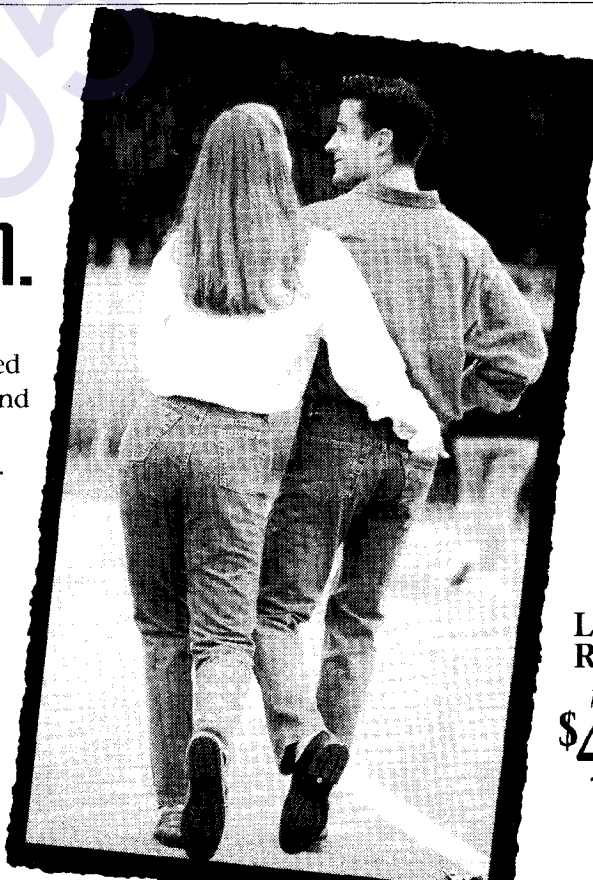
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The Asian Centre

The Asian Centre opened on the UBC campus in 1981, built with funds donated by Asian business interests, largely Japanese, the provincial and federal governments of Canada, Canadian business and the general public. The Asian Centre houses the Asian Library, the Institute of Asian Research, the Department of Asian Studies, the International Liaison Office and provides space for the Asian interests of the School of Music.

The Asian Centre has an auditorium seating up to 200 people, a music performance studio with seating capacity of 100, meeting rooms, and a Japanese Tea Gallery. These facilities can be made available to both university and public groups concerned with Asia. To book these areas call (604) 822-4688, Monday to Friday. The building is open during the regular hours of the Asian Library.

Athletic and Sport Facilities

Athletic and Sport Facilities is the building division of Athletic and Sport Services and coordinates the management of several facilities on campus. For information and availability please contact the individual facilities listed below or the general office of Athletic and Sport Facilities, 6081 University Boulevard, War Memorial Gym, Vancouver, B.C. V6T 1Z1; telephone: (604) 822-3917, fax: (604) 822-6011.

Thunderbird Winter Sports Centre

The Thunderbird Centre complex is the result of several construction phases. The initial phase was officially opened on October 25, 1963. This phase included the 1,284 seat main rink, a six sheet curling rink and a licensed lounge and restaurant, which has since been named the Thunderbar. The \$500,000 facility was funded by the Alma Mater Society, the Molson Foundation, the Federal, Provincial Winter Works Program and the UBC Board of Governors.

In December 1969, a \$1 million expansion was completed and contained a court centre with four squash and two handball courts, several change and ancillary rooms and two additional hockey rinks. The new area included a pro-shop with a wide range of rental and retail hockey services. In 1990, the Thunderdeck was completed including a licensed and seasonal lounge with an outdoor patio overlooking the outdoor playing fields and tennis courts.

The 1969 expansion was funded with retained earnings from facility operations. This funding precedent for campus development was again applied in 1993 with the conversion of the curling rink to a fourth hockey rink. Also constructed were several changerooms, an upgraded main entrance and extensive infrastructure upgrade. The total cost for construction and concession was in excess of \$1.5 million.

The Thunderbird Centre hosts varsity and intramural hockey, tournaments, and campus and community league play. The lounges provide year round food and beverage and medium size banquet services. The Banquet room operates September through April. The lounges offer full satellite TV Sports bar services year round and the squash and racquetball courts serve the campus and community populations. Paid parking is available immediately adjacent to the centre.

Thunderbird Stadium

The Stadium is the largest outdoor public assembly facility on campus. Opened in October 1967, the 3,500 seat stadium is home to the UBC football Thunderbirds. The

University Services and Facilities

\$1 million development was funded by the UBC Board of Governors. The seats are covered by a roof suspended by cables supported by twelve reinforced columns topped by concrete Thunderbirds. A new scoreboard was installed in 1994. Conventional field lighting was installed in 1980.

The Stadium provides a range of event services required for football, rugby and soccer games and has been re-configured to handle crowds of 30,000 for festivals. Not generally available for individual intramural activity, it does provide an opportunity for students to use it for varsity and spectator events and to attend the annual Arts County Fair on the last day of classes in Spring.

War Memorial Gymnasium

The gymnasium was officially dedicated on October 26, 1951. A student-alumni campaign contributed funds towards the \$800,000 cost to construct the facility to honour the men and women of British Columbia who served in World Wars I and II. The main hall currently holds 2,100 spectators with seating to be increased to 3,500 by 1995. The facility contains offices of the Department of Athletic and Sport Facilities, the School of Human Kinetics and the Athletics division of the Department of Athletics and Sport Services.

The gymnasium serves as a site for basketball and volleyball practices and games for varsity and intramural sports, for sport tournaments and championships and for special events. The gymnasium also hosts convocation ceremonies, at which time all UBC degrees are awarded. The facility is the primary locker and shower facility for students, faculty, and staff with full services available at a nominal cost. UBC Lost and Found Services are provided through the equipment dispensary of the gymnasium.

In 1994, seating was upgraded from wooden benches to individual theatre seats. Six hundred seats were added at floor level on telescoping bleacher platforms. Two new scoreboards were installed and professional gooseneck basketball backboards were acquired.

UBC Aquatic Centre

The Aquatic Centre includes an open air fifty metre pool and an indoor fifty metre pool. The outdoor Empire Pool, which adjoins War Memorial Gymnasium, was completed in 1954 to provide competitive swimming and diving facilities for the British Empire and Commonwealth Games hosted that year. Funded by the British Empire and Commonwealth Games Canada (1954) Society, the pool includes five and ten metre diving platforms.

The indoor pool, completed in 1978, was funded primarily by the Alma Mater Society, the Alumni Association, the Federal and Provincial Governments and the UBC Board of Governors. The \$5.8 million complex includes a fifty and a twenty five metre pool and a twenty five yard pool,

a five metre diving platform and, one and three metre diving boards. The lower level of the indoor complex includes an extensive fitness centre complete with sauna and steam room facilities, and the John M. Buchanan Fitness and Research Area.

The centre is a significant employer of students throughout the year offering opportunities in life guarding, swim instruction and general office operations. University swims provide an opportunity for students, faculty and staff to utilize the facility on a regular basis. The centre also hosts the combined UBC Thunderbird and Vancouver Dolphins Swim Clubs, a wide range of campus and community aquatics lessons and special events.

Playing Fields

The William Eugene MacInnes Field is situated north of War Memorial Gym and south of the site dedicated for the Student Recreation Centre. The field was funded by Mr. and Mrs. W. H. MacInnes in memory of their son who graduated in Arts and Mining Engineering. Utilized more heavily than any other playing field for intramural field events, the field is also used for special events and serves as a green space for student activity.

Thunderbird Park is located south of the Thunderbird Winter Sports Centre and includes eighty acres combining fifteen playing fields. Construction of the fields was largely completed in June 1967. While it includes Thunderbird Stadium, the park is generally described as including the Wolfson I and II Fields, the O. J. Todd, Arthur Lord, Frank Buck, Chris Spencer, Whitt Matthews, Harry Warren, Malcolm McGregor, Evelyn Lett and Osborne Fields. Also included is the Harry Logan Track. The four Wolfson Rugby Fields had lights installed in 1979.

The Chris Spencer Field was developed for cricket and field hockey and funded by the Chris Spencer Foundation and university friends. The Wolfson Fields were funded by the Wolfson Foundation, London, England through the efforts of the B.C. Playing Fields Association, Sir Overy Roberts, Dr. Harry Warren and Robert Spray of the B.C. Rugby Union. In 1980, Evelyn Lett, O. J. Todd and Wolfson II Fields had sand-cellular systems installed to allow wet season play.

Used primarily for varsity practices and games, the fields are experiencing increasing use for intramurals, summer sport camps, special event and community usage. Given availability and condition, fields can be booked for tournaments or special events by campus or community groups.

Student Recreation Centre

Scheduled for completion in 1995, the centre is the first on campus dedicated primarily to student recreation and intramural pursuits. Located on Student Union Boulevard at the north end of MacInnes Field, the facility will contain three gymnasiums, a fitness centre, studios for martial

arts and dance and a playcare area. Largely a student initiative, the project is funded by \$5 million in student contributions matched by the Provincial government as part of the UBC campaign.

The facility is intended to become the campus centre for physical activity with extensive locker and shower room facilities for users of MacInnes Field, bicycle commuters, building users and the general campus community. As a community centre, the facility will host a range of sporting, social and cultural activities.

UBC Tennis Centre

The University has ten outdoor courts adjacent to the Thunderbird Winter Sports Centre. The centre offers a range of Spring and Summer lessons for adults and juniors. Courts can be booked individually for a nominal fee. Plans to develop an indoor tennis facility are ready to go pending funding becoming available. There are four outdoor courts allocated to be covered for indoor use. The new facility would have to meet the needs of students and the broader campus community.

Athletic, Intramural Sports and Recreational Programs

Opportunities are available at the University of British Columbia for students to participate in a wide variety of sports-related activities. In co-operation with the Alma Mater Society, the University sponsors an extensive Intercollegiate, Intramural and Recreational sports program. Students are encouraged to participate in the activities which best suit their needs.

Students who meet university athletic eligibility requirements are encouraged to try out for any one of several sports administered through the men's and women's intercollegiate programs. In competition with other universities, UBC has established a reputation as having one of the most outstanding intercollegiate programs in Canada.

The Intramural and Recreational sports programs provide on-campus opportunities for competitive and drop-in sports for faculty, staff and students. Over 100,000 participants are attracted annually to these programs. Opportunities are also provided for those who wish to participate in self-directed sport activities. Facilities such as Osborne Centre can be booked for this purpose.

For the use of the Thunderbird Winter Sports Centre, the Aquatic Centre, and War Memorial Gymnasium, contact must be made with the administrative offices located in each facility.

For further information on any of the above programs, please contact the appropriate offices listed below:

Aquatic Centre	(604) 822-4521
Athletic and Sports Services Office Room 272, War Memorial Gym	(604) 822-2551
Intramurals and Campus Recreation UBC 66 Sub Plaza	(604) 822-6000 or (604) 822-3996
Thunderbird Winter Sports Centre	(604) 822-6121
War Memorial Gymnasium	(604) 822-3093
24-hour Thunderbird scores and event information	(604) 222-BIRD

Awards and Financial Aid

The University offers a wide range of programs to recognize students with high academic achievement and provide financial assistance to those who cannot meet basic educational costs. Academic awards for undergraduate study as well as all financial need-based awards are administered by the Office of Awards and Financial Aid. Aca-

demical awards for students in graduate studies are administered by the Faculty of Graduate Studies. Detailed information on awards and application procedures is included in the UBC publication, Awards and Financial Aid, which is available from the Awards Office. The Awards Office is located in Brock Hall, Room 1036, 1871 East Mall, Vancouver, B.C. V6T 1Z1; telephone (604) 822-5111. The Faculty of Graduate Studies is located in Room 235 of the General Services Administration Building; telephone (604) 822-4556. Both offices are open from 8:30 am to 4:00 pm, Monday through Friday.

Undergraduate Students

There are many forms of assistance available to undergraduate students (including those in professional programs) attending winter session at the University of British Columbia. Assistance programs fall into two general categories: those based on academic achievement (scholarships and prizes, etc.), and those based on financial need (bursaries, loans and work study).

Scholarships

Students demonstrating outstanding academic performance will be considered for scholarships and other academic awards. These awards are made available through contributions from corporate and individual donors as well as from the University operating budget. A majority of scholarships are awarded on the recommendation of a specific faculty or department, without the need for an application; however, some scholarships do require that the student apply.

Several major entrance scholarships with annual values ranging from \$2,500 to \$6,500 are offered to students of outstanding academic calibre entering the University from secondary school. Students who receive renewable scholarships or scholarships payable over four years must maintain scholarship standing to be eligible to receive the award. To retain scholarship standing, students must be enrolled in 90% of a full course load for their year and faculty and obtain an 80% average with no failed courses. Entrance awards include:

- National Scholarships – The University of British Columbia offers up to ten awards of \$26,000 (payable at \$6,500 a year) each to outstanding students entering undergraduate programs from secondary schools in Canada.
- Hugh M. Brock National Entrance Scholarship – Up to ten \$26,000 scholarships (payable at \$6,500 a year) have been made through the estate of Hugh M. Brock. These scholarships will be awarded to outstanding students entering the University from Canadian secondary schools.
- The Mount Pleasant Branch #17, Royal Canadian Legion Scholarship – A \$20,000 scholarship (payable at \$5,000 a year) has been made available by the Mount Pleasant Branch of The Royal Canadian Legion, Vancouver, B.C., through the Vancouver Foundation. It will be awarded to a student entering the University from a Canadian secondary school. The applicant must be a Canadian citizen (a) born in Canada or (b) born of Canadian parent(s). In selecting candidates, consideration will be given to scholastic achievement and personal qualities, as well as interest and participation in school or community activities.
- The Bert Henry Memorial Scholarship – An \$18,000 scholarship (payable at \$4,500 a year) has been made available by the late Gladys Henry. The award will be made to a student proceeding from a secondary school to The University of British Columbia.

- Chancellor's Entrance Scholarship – The University of British Columbia offers up to 20 scholarships of \$14,000 each (payable at \$3,500 a year) to outstanding students entering undergraduate programs from secondary schools.
- President's Entrance Scholarships – The University of British Columbia offers up to 25 scholarships of \$8,400 each to outstanding students entering undergraduate programs from secondary schools. The award is payable at \$3,000 for the first year and \$1,800 for the next three years.
- University of B.C. Royal Institution Entrance Scholarships – Two scholarships of \$8,400 each will be awarded to outstanding students entering undergraduate programs from secondary schools. The award is payable at \$3,000 for the first year and \$1,800 for the next three years.
- Charles A. and Jane C. A. Banks Foundation Entrance Scholarships – Five scholarships of \$7,900 each will be offered to outstanding students entering the faculties of Science, Applied Science (Engineering), Forestry or Agricultural Sciences, from secondary schools. The award is payable at \$2,500 for the first year and \$1,800 for the next three years.
- Rayrock Yellowknife Resources Inc. Entrance Scholarship – Scholarships totalling \$13,500 have been endowed by Rayrock Yellowknife Resources Inc. and the Province of British Columbia. These scholarships will be awarded to outstanding students entering first year at the University from Canadian secondary schools.
- Avenor Inc. Entrance Scholarship – Scholarships totalling \$9,000 have been endowed by Avenor Inc. and the Province of British Columbia. These scholarships will be awarded to outstanding students entering first year at the University from Canadian secondary schools.
- Crown Life Insurance National Entrance Scholarship – A \$3,000 scholarship has been endowed by Crown Life Insurance Company and the Province of British Columbia. The scholarship will be awarded to an outstanding student entering first year at the University from a Canadian secondary school.
- Norman Mackenzie Alumni Entrance Scholarships – Scholarships of \$2,400 each are offered to British Columbia residents entering undergraduate programs from senior secondary schools located in designated geographic regions of the province.

In addition to the major entrance scholarships listed above, the following faculties or schools offer large scholarships to outstanding students entering their discipline: Engineering, Forestry, Agriculture, Music.

New students who do not qualify for the major entrance scholarships listed above may be nominated through UBC's Admissions process for the Outstanding Student Initiative Program (OSI). This program recognizes those students who have achieved academic excellence in secondary school. Students entering the university from secondary school with an average of 86% with no courses lower than 86% receive a scholarship equivalent to first year fees in the Faculty of Arts, early unconditional admission, guaranteed housing in UBC residences, an early TELEREG registration date, and will be eligible to purchase a Student Parkade Permit directly from Parking Services. The award is renewable for the next three years at \$1,800 per year.

There is also a range of smaller general scholarships, ranging in value from \$500 to \$2,200 each, to recognize academic excellence in entering students.

Students entering UBC directly from secondary school must apply for major entrance scholarships by April 15. Students entering UBC from other post-secondary institutions who wish to be considered for scholarships must submit an application for scholarships by May 15. Some scholarships require special affiliations with clubs, unions, businesses, the armed services, etc. Applications for affiliation scholarships are available in early spring and must be submitted by May 15.

Note: Since deadlines may change from year to year, students planning to enter UBC in 1996 should contact the Awards Office early next year.

Financial Aid

The major source of assistance for B.C. students who require financial assistance to pursue their educational objectives, is the British Columbia Student Assistance Program (BCSAP). B.C. students may obtain up to \$7,990 (\$12,240 for students with dependent children) in a combination of Canada Student Loan and British Columbia Student Loan or B.C. Grant. Students from other provinces may be able to obtain assistance through their "home" province. The University also offers bursaries, work study, and emergency loans to students demonstrating financial need. Students wishing to apply for BCSAP or similar assistance are encouraged to apply early. Applications are available in the spring and should be submitted to the B.C. Ministry of Skills, Training and Labour or to the appropriate ministry in other provinces prior to the last working day in June, if funds are needed by the beginning of the term. Students in part-time studies (less than 60% of a full load) may apply for the Part-time Student Assistance Program (PTSAP), which is intended to assist with the cost of tuition and books for Canadian citizens or permanent residents who can establish assessed financial need. A limited number of affiliation bursaries require a special application which must be submitted by June 30. Applications for general bursaries are available in September and the submission deadline is October 1. Students wishing additional information may obtain the UBC publication, Awards and Financial Aid, which contains detailed award descriptions.

International Students

International students who will require financial support to attend UBC must arrange this support prior to their arrival in Canada. International students are eligible to compete for awards assigned on the basis of scholastic performance for which the source of funds is the University operating budget, annual gifts, or income from endowments managed by UBC. Competition for these awards is keen and the monetary value of each award covers only a portion of the full cost of study for one year at UBC.

Funding for international students with demonstrated financial need is limited as international students are not eligible for assistance through the Canada Student Loan Program. United States citizens or nationals are eligible to apply for Subsidized and Unsubsidized Stafford Loans to attend UBC. Further details about funding programs may be obtained through the Awards and Financial Aid Office.

Regulations Governing University Awards

The following regulations, as approved by the University Senate, govern all awards over which the University has jurisdiction.

1) It is the policy of the University to attract, at both graduate and undergraduate levels, the best academically qualified students, whatever their origin. With

that objective in mind, it is the primary policy of the University to encourage donations, whether to individual Faculties or to the University's general scholarship and bursary funds, that can be used to reward excellence or to support needy students without restrictions based on non-academic considerations. Such donations maximize fairness, flexibility and efficiency in the administration of available funds.

- 2) Unless otherwise stated, awards are tenable only at UBC and are open to winter session students only. Marks obtained in Summer Session courses are not taken into account.
- 3) An award designated as a scholarship will normally be made only to a student standing in the top 10% of his/her year and faculty, or with an average of 75% or higher. Prizes or other academic awards which are based on performance in a specific course require that the student stand in the top 10% of students registered in the course, or obtain an average of 75% or higher for the course in question. Where scholarships are renewable or include a guarantee of continuing support to a student maintaining "scholarship standing", this shall be interpreted as meaning that a student must successfully complete at least 90% of a full program of study with an overall average of at least 80%, or stand in the top 10% of his/her year and degree program.
- 4) To be eligible for a scholarship, a student must normally have completed a full program of study for the year and faculty in which he/she was enrolled. This is defined as 90% or more of a full course load as prescribed by the Dean of the Faculty. The standing of students taking more than the required number of credits will be determined on the basis of the required number of credits to be chosen in a manner most advantageous to the student.
- 5) Candidates are permitted to hold more than one academic award only with the permission of the Awards Office. A winner may retain the honour of winning an award but resign the monetary value. Any funds thus made available will be used for additional awards.
- 6) Awards issued by the University are applied to tuition fees. If the amount of the award is greater than the fees, the excess is paid to the student after the tuition fees have been deducted. Cheques should be picked up at the Awards Office, Room 1036, Brock Hall (East Wing), on the dates indicated on individual award notices.
- 7) Holders of scholarships and bursaries are expected to be enrolled in at least 80% of a full program of study. Awards are made only to those who continue their studies to the satisfaction of the Awards Office and may be withheld for unsatisfactory attendance or progress.
- 8) Students who have completed at least one year of study at UBC may be eligible to defer certain scholarships for one year, provided they show satisfactory reasons for postponing attendance. Application for deferment must be made to the Awards Office. Students wishing to take up an award deferred from a previous year must advise the Awards Office by July 1st. Entrance scholarships are not normally deferred. Exceptions may be made, however, for students who are recipients of specific awards such as the Rotary Foundation Scholarship and the Pacific Rim Scholarship (through the Province of British Columbia).
- 9) Scholarships awarded for achievement in a specific faculty or discipline are normally conditional upon

the winner continuing studies in the same discipline during the following year. A course-change to an ineligible faculty or discipline will usually result in re-assignment of the award to another student.

- 10) Bursaries are awarded on the basis of financial need.
- 11) If invested funds do not provide the necessary income for any endowed award, payment of the award may be reduced or the award withheld. The University does not guarantee the payment of any awards other than those from the funds of the University. The University reserves the right to withhold awards donated by individuals or organizations where the funds required have not actually been received.
- 12) 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 conditions, may more fully carry out the intentions of the donor, or maintain the usefulness of the benefaction. The rights so reserved shall be exercised by 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 representative, if known, shall be consulted about the proposed change.

Graduate Students

Financial support for graduate students usually comes from one of four basic sources: (a) merit-based awards administered by the Faculty of Graduate Studies; (b) teaching and research assistantships administered by individual departments; (c) need-based awards administered by the Office of Awards and Financial Aid; (d) external awards from other agencies.

The major source of assistance for B.C. students anticipating financial difficulties in the pursuit of their educational objectives is the British Columbia Student Assistance Program (BCSAP). B.C. students may obtain up to \$5,460 in Canada Student Loans and \$5,772 (\$11,232 for students with dependent children) in B.C. Student Loans for a twelve-month program. Students from other provinces may be able to obtain assistance from their "home" province. The University also offers bursaries, work study, and emergency loans to students demonstrating financial need. Students wishing to apply for BCSAP or similar assistance are encouraged to apply early. Applications are available in the spring and should be submitted to the Ministry of Skills, Training and Labour prior to June 30, for students needing their funds by the beginning of the term. Applications for general bursaries are available in September and the deadline is October 1. Students requiring assistance should obtain the UBC publication, Awards and Financial Aid, which contains detailed information.

Regulations Governing Graduate Awards

- 1) It is the policy of the University to attract, at both graduate and undergraduate levels, the best academically qualified students, whatever their origin. With that objective in mind, it is the primary policy of the University to encourage donations, whether to individual Faculties or to the University's general scholarship and bursary funds, that can be used to reward excellence or to support needy students without restrictions based on non-academic considerations. Such donations maximize fairness, flexibility and efficiency in the administration of available funds.
- 2) The fellowships and scholarships offered are available only for full-time study and/or research leading to a higher degree in the Faculty of Graduate Studies at

The University of British Columbia and will normally be paid if the recipient is in full-time study and/or research at the University on the payment dates. Full-time study means that the student may not commit more than **12 hours per week** of working time, including teaching assistant or research assistant duties to matters other than the degree. Students whose programs require off-campus field work must submit a letter of authorization from the head of the department.

- 3) A fellowship or scholarship recipient is not permitted to hold, simultaneously, other major fellowships, scholarships, or support from governments.
- 4) The University does not deduct income tax from the fellowship awards, which are taxable in the hands of the recipient.
- 5) Board and room, and other fees are the responsibility of the student.
- 6) Subject to satisfactory standing and progress, Full University Graduate Fellowships are normally renewable for a second year. After one renewal, candidates who wish to apply for a further award can re-enter the competition, provided they are still eligible according to UGF regulations. Partial University Graduate Fellowships and awards from the Hugo E. Meilicke Fund, and the Tina and Morris Wagner Foundation and other internal graduate awards are for one year only.
- 7) Killam Predoctoral Fellowships are subject to the same terms of award as University Graduate Fellowships.
- 8) Before beginning their studies at UBC, successful UGF candidates will be allowed to defer their scholarship for one year. Deferrals will not be approved in order for the holder to accept another scholarship or to pursue another undergraduate or any postgraduate degree or professional studies.
- 9) University Graduate Fellowship may be suspended during approved leave (1 to 12 months) and the fellowship may be resumed after a leave is completed. Support would continue, subject to the usual renewal requirements, to the total time of two years, not including leave time.
- 10) Part-time students may apply for a fellowship but must be full-time students when the fellowship is taken up.
- 11) If invested funds do not provide the necessary income for any endowed award, payment of the award may be reduced or the award withheld. The University does not guarantee the payment of any awards other than those from the funds of the University. The University reserves the right to withhold awards donated by individuals or organizations where the funds required have not actually been received.
- 12) 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 conditions, may more fully carry out the intentions of the donor, or maintain the usefulness of the benefaction. The rights so reserved shall be exercised by 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 or her representative, if known, shall be consulted about the proposed change.

Bookstore

– see **The University Bookstore**

Botanical Garden

The history of the Botanical Garden at the University dates back to 1912 when two acres of land were set aside on the Provincial Colony Farm at Essondale. In 1916, the collections established at Essondale were moved about 20 miles to the present University site. Dr. John Davidson was appointed as the first Director of the Botanical Garden.

The present gardens consist of 70 acres on the western edge of the campus. Forty-four acres were set aside in 1966 west of the Thunderbird Sports Stadium as a new Botanical Garden area.

An older established area of the Botanical Garden is represented by Nitobe Memorial Garden. This Garden, which opened in June 1960, was dedicated to the memory of Dr. Inazo Nitobe, distinguished educator and international civil servant, who did much to interpret Japan to the West and the West to Japan. It was designed by Professor K. Mori of the University of Chiba and was developed to provide an authentic example of Japanese landscape architecture for the campus. Plants contained in the garden are of both Japanese and North American origin. The garden represents one of the finest examples of Japanese landscape architecture in North America.

Areas have been established, including a nursery in the south campus, an Alpine Garden, a B.C. Native Garden, a Contemporary Garden, Arbor, Physick Garden, a Food Garden and an Asian Garden, all in the Main Garden site near Thunderbird Stadium with the entrance at 6804 S.W. Marine Drive.

In April 1978, the 2.5-acre alpine garden was officially dedicated and named The E. H. Lohbrunner Alpine Garden in honour of Mr. Lohbrunner's continuing contribution to alpine plant horticulture in British Columbia. At the same time, the eight-acre B.C. Native Garden was dedicated to Professor John Davidson, first Botanical Garden Director and longtime member of the UBC Faculty.

In May 1981 the specialized medicinal and pharmaceutical garden known as the Physick Garden was officially dedicated and, at the same time, the 30-acre Asian Garden was also dedicated. It contains an outstanding collection of over 400 species of Rhododendrons, along with a good collection of woody and herbaceous plants from Asia. This garden is now called the David C. Lam Asian Garden.

In September 1990, a new education, visitors', and research centre was opened at the David C. Lam Asian Garden. The Botanical Garden serves as a repository for living plant collections used for teaching and research programs and is open to the public. A public horticultural information service is available by calling (604) 822-5858. An endowment membership program, The Davidson Club, was established in 1982 to provide public support for the Garden. Office and Shop-in-the-Garden are located at 6804 S.W. Marine Drive.

Canadian Forces Post-Secondary Education Plans

The high professional ability required of present-day military officers demands the best in education and training. To ensure this, the Department of National Defence (DND) sponsors university education programs and leadership training for selected young Canadian men and women who have the potential to become officers in the Canadian Forces. These programs include the Regular Officer Training Plan (ROTP), the Medical Officer Training Plan (MOTP) and the Dental Officer Training Plan (DOTP).

Each plan offers a fully subsidized education where the cost of tuition, books, uniforms, required instruments and other essential fees are paid for by DND for a maximum number of years. In addition, successful applicants are provided with a monthly salary, free medical and dental care and 20 days of vacation annually. Each plan is divided into two parts; attendance at university throughout the academic year and military training each summer. A period of compulsory military service is a condition of acceptance to any one of these programs.

ROTP

The Regular Officer Training Plan is a four-year (maximum) university program leading to a university degree and a career as an Officer in the Canadian Forces in an occupation of the student's choice. Obligatory service for ROTP is five years (seven years for Pilots).

Undergraduate students are also eligible to apply for this program provided they have at least one full year remaining prior to graduation.

MOTP

Subsidization under the Medical Officer Training Plan is for the final three years of medical school and up to two years of internship leading to a career as a Medical Officer in the Canadian Forces. Applicants **must be unconditionally accepted** into the second year of a Canadian medical school program to be considered for this plan. Upon successful completion of the degree program, and after becoming licensed to practice medicine, the student will be employed as a general practitioner in the Canadian Forces for a compulsory period of service of up to four years' duration.

DOTP

Subsidization under the Dental Officer Training Plan is for a maximum of four years. Applicants must be unconditionally accepted into the Faculty of Dentistry at a Canadian university of their choice. Upon successful completion of the degree, and after becoming licensed to practice medicine, the student will be employed as a Dental Officer in the Canadian Forces for a compulsory period of service of up to four years' duration.

Application Requirements

An applicant must:

- 1) be a Canadian citizen;
- 2) if ROTP — be at least 16 years of age on or before January 1 of the year of enrolment, or if MOTP or DOTP — be at least 17 years of age on the date of enrolment;
- 3) meet all academic requirements; and,
- 4) meet aptitude testing and medical standards, and be found suitable for employment in the Canadian Forces.

Information

Individuals interested in obtaining more information on, or wishing to make application for, any of these plans are requested to contact the Commanding Officer, Canadian Forces Recruiting Centre Vancouver, Sinclair Centre, 757 West Hastings Street, Suite R125, Vancouver, B.C. V6C 1A1; telephone (604) 666-1192 or 1-800-856-8488 (Toll Free).

Child Care Facilities

There are twelve child care programs on campus caring for children from birth to twelve years of age. The programs are popular so applications must be made early. Contact the Child Care Services Office, 5590 Osoyoos Crescent, Vancouver, B.C., V6T 1X7; telephone (604) 822-5343 for information and waiting list applications.

Computing and Communications

Computing and Communications supports the campus community in the development and operation of information and communication infrastructure including:

- Academic and Administrative Computing
- Printing and Publishing
- Voice, Data and Video Network Services

For information about services contact:

University Computing Services (UCS)	(604) 822-6611
Telecommunication Services	(604) 822-2555
Media Services	(604) 822-5931
UBC Press	(604) 822-3259

Continuing Studies

In response to the evolving needs of the public, UBC merged three offices (the former Centre for Continuing Education, Office of Extra-Sessional Studies and UBC Access Guided Independent Study) into one unit called Continuing Studies. This unit offers both non-credit and credit programs through its divisions.

Continuing Studies Non-Credit Divisions

Continuing Studies offers over 650 non-credit courses each year to increase enjoyment of the arts, humanities and sciences, to improve communication skills and to enhance personal and career development. Most courses have no prerequisites and take place on the UBC campus. Seasonal course calendars are published in April, September and January. Call to receive a free calendar. The office of Continuing Studies Non-Credit Divisions is located at 5997 Iona Drive, Vancouver, B.C., V6T 1Z1; telephone (604) 822-1444.

Continuing Studies Credit Division

Continuing Studies Credit Division unites Extra-Sessional Studies and Guided Independent Study. It is responsible for the coordination and administration of all credit courses offered after 4:30 pm during the Winter Session; on a daytime and evening basis over the two Summer Session terms; through a Directed Study Abroad program; and through UBC Access Guided Independent Study.

Working in cooperation with over 100 academic and administrative departments in seven faculties, the Division offers an expanding number of degree programs available entirely through part-time study. This diverse program enrolls over 15,000 students each academic year, meeting the needs of a wide range of people who wish to work toward a degree on a part-time basis. The office of Continuing Studies Credit Division is located at 2329 West Mall, Vancouver, B.C., V6T 1Z4; telephone (604) 822-2657.

English Language Institute (English as a Second Language)

The English Language Institute offers courses in English as a second language for students who wish to improve their ability in spoken and written English.

The Immersion Program is made up of both Academic Preparation and Communication courses.

Academic Preparation courses are designed for students who wish to study at post-secondary institutions where instruction is given in English. These courses are open to students who have not achieved the 570 TOEFL (580 for Arts) score required for admission to UBC. Communication courses are designed to improve students' fluency and overall listening and speaking skills. Both Academic Preparation and Communication courses are offered during the day, four times per year.

All courses offered by the English Language Institute are non-credit and do not guarantee admission to a university or college. For further information, write or telephone the English Language Institute, Continuing Studies, 5997 Iona Drive, Vancouver, BC, V6T 1Z1; telephone (604) 822-1550; fax (604) 822-1599.

UBC Access Guided Independent Study

As part of Continuing Studies Credit Division, UBC Access Guided Independent Study offers credit courses in Agricultural Sciences, Arts, Education, Forestry and Nursing (post-R.N.) for home study. These distance education courses provide one of the study options open to UBC students who are unable to attend scheduled classes. Flexibility is an important characteristic of the program: many courses have six sessional offerings each year. The courses combine tutoring by qualified instructors with the convenience of home study. The degree credit offerings carry full credit toward degree or diploma programs in accordance with the requirements of the faculty concerned. Courses are also available through the universities consortium of the Open Learning Agency.

Calendars, brochures and registration information relating to Continuing Studies, can be obtained at 2329 West Mall, Vancouver, B.C., V6T 1Z4; telephone (604) 822-6565.

University Writing Centre

The University Writing Centre offers two one-term non-credit courses in writing to students who wish to enrol in first-year English courses but who have yet to achieve a level 5 or 6 on the Language Proficiency Index (LPI). Writing 098C/D is for students with English as a first language. Writing 098A/B is for students with English as an additional language. The purpose of these courses is twofold: to assist students in developing the skills in language and composition necessary to achieve the necessary level on the LPI and to enable them to prepare for the writing tasks they will face in first-year English and in many other credit courses which require students to write essays and reports.

UBC students enrol in Writing 098 using TELEREG. The course schedule is listed in the Registration Guide under "University Writing Centre Courses." Non-UBC students should call the Writing Centre and enrol through Continuing Studies.

Please note that course fees and withdrawal procedures differ from those of regular credit courses. For more information, telephone (604) 822-9564.

Specialized non-credit writing courses for graduate students, aspiring authors and public relations professionals are offered by the Writing Centre and the Arts and Humanities Division of Continuing Studies. For more information, telephone (604) 822-1444.

Development Office

The Development Office works to advance the goals of the University by increasing private funding to UBC. Individuals, corporations, foundations and service organizations contribute to UBC's development through annual, special and major campaign gifts. Individual donors also contribute through bequests, gifts-in-kind, and other planned gifts. Monies raised are used for buildings, scholarships, endowed chairs, library acquisitions, equipment and other academic priorities.

The Development Office has the mandate to be UBC's institutional focus for central fund-raising support, expertise and assistance to campus development and fund-raising activities. This includes co-ordinating and inte-

grating the fund-raising initiatives of the University as a whole, its various academic units and departments, in order to achieve optimal long-term development results and success with donors.

For more information about gifts to UBC, call the Development Office at (604) 822-8900.

The Disability Resource Centre

RUTH WARICK, B.A. (Sask.), M.A., M.Ed. (Regina), Director.

The Disability Resource Centre was established to facilitate the development of programs and initiatives which foster the participation of persons with disabilities in post-secondary institutions. The Centre's role is to promote the full involvement of students, faculty, staff and visitors with disabilities in all that the University of British Columbia has to offer.

One of the Centre's goals is to foster an accessible learning environment at UBC and to work with the university community, and the community at large, in eliminating systemic, structural and attitudinal barriers to the participation of disabled persons within the University.

The Centre has a mandate to work cooperatively with the various faculties, schools and administrative units on campus to support services, research, teaching and program initiatives which relate to disabilities. The Centre also provides a service liaison function to students with disabilities at UBC.

An advisory committee comprised of university faculty, staff, and student representatives from community organizations, government and the private sector provides advice to the Director of the Centre. The Committee is chaired by the incumbent of the Rick Hansen National Fellow Program.

The Centre is financed by contributions from the federal government, the provincial government, the Vancouver Foundation and the private sector. The centre is located at 1874 East Mall. For information please call the Disability Resource Centre at (604) 822-5844; TDD only (604) 822-9049; fax (604) 822-6655.

Services for Students with Disabilities

The University provides a wide variety of services for students with disabilities. The Disability Resource Centre coordinates the provision of services such as interpreting, note taking, reading, peer tutoring, research and mobility assistance, and facilitates the provision of specialized equipment. Students with disabilities should contact Wendy Keenlyside, Liaison Officer, to discuss eligibility for services. To make an appointment call (604) 822-5487 or (604) 822-9049, Monday to Friday, 8:30 am to 4:00 pm. Further information may be obtained through the Disability Resource Centre's publications, including the *Handbook for Students with Disabilities* and the *UBC Physical Access Guide*.

Equity Office

The Equity Office coordinates UBC's employment and educational equity program; as well as UBC's policies on discrimination and harassment, including sexual harassment. Advisers are available to discuss questions and concerns about discrimination and harassment and to receive formal complaints from UBC students, staff, and faculty. All discussions are confidential and without obligation to proceed further. The office is located in room 306, Brock Hall, 1874 East Mall, Vancouver, B.C. V6T 1Z1; telephone (604) 822-6353.

First Nations House of Learning

Giving Voice to our Ancestors

The First Nations House of Learning was established in 1987 to make UBC and its resources more accessible to B.C.'s First People, and to improve the University's ability to meet the needs of First Nations. Through various processes of consultation with First Nations communities, the House of Learning aims to provide a quality post-secondary education determined by the philosophies and values of First Nations.

The First Nations House of Learning is located in the spectacular new First Nations Longhouse which is the hub of First Nations activities on campus. The Longhouse serves as a "home away from home" where students can study and learn in surroundings which reflect their heritage and culture; and provides a place where First Nations people can share their knowledge and cultures with each other, with the University community and with the larger society. The traditional Salish-style Longhouse structure includes a Great Hall, an elder's lounge, child care facilities, a Sacred Circle, a student and staff lounge, kitchen, a library/resource centre; and administrative offices.

The House of Learning promotes a number of initiatives designed specifically for First Nations students. These include: First Nations Health Careers, Native Indian Teacher Education Program, First Nations Law Studies and Ts'kel Graduate Studies. The House of Learning is committed to assisting First Nations students achieve their academic goals in all areas of post-secondary study.

To enhance the goal of "1000 First Nations students by the year 2000" the House of Learning provides information on post-secondary opportunities and offers counselling and support services for First Nations students. In addition, the staff are working toward expanding course and program offerings in a wide array of study areas to respond to post-secondary education and research priorities identified by First Nations. A goal of the House of Learning is to increase the First Nations leadership on campus, and a longer range plan includes an international component for the advancement of Indigenous peoples around the world.

Students are encouraged to visit the First Nations Longhouse at 1985 West Mall, The University of British Columbia, Vancouver, B.C., V6T 1Z2; telephone (604) 822-8940, fax (604) 822-8944.

Food Services

– see **UBC Food Group**

Housing

– see **Student Housing**

Human Resources

Human Resources works in partnership with departmental managers and supervisors in the delivery of recruitment, job evaluation, organizational change, human resources planning, total compensation management, training and development, employee relations and the management of the University's human resources data bases.

International Student Services

Mandate

International Student Services (ISS) is an integral part of Student and Academic Services in the University. With the assistance of over 400 volunteers per year, the staff provides support services to international students, coordinates university student exchange programs and manages the social/cultural centre at International House. The Main Office is located at International House, 1783 West Mall, The University of British Columbia, Vancouver, B.C. V6T 1Z2; telephone (604) 822-5021, fax (604) 822-5099. The Student Exchange Office is located in Brock Hall, 1874 East Mall, room 2061, The University of British Columbia, Vancouver, B.C., V6T 1Z1; telephone (604) 822-8947, fax (604) 822-5945. The Outreach Office is located in Brock Hall, 1874 East Mall, room 262, The University of British Columbia, Vancouver, B.C., V6T 1Z1; telephone: (604) 822-0617.

The goals of the ISS are

- to support the academic and personal growth of exchange students and international students, and
- to enrich the learning environment of the UBC community by broadening the international experience on campus.

Support Services

Summer services include

- pre-departure information
- airport reception
- temporary accommodation
- orientation

Year-round services include

- advice on non-academic matters such as visas, health insurance, and cross-cultural adjustment
- assistance to exchange students on matters such as registration, credit transfer, and exchange scholarships
- information sessions and information on various student exchange programs
- peer program—a buddy system that matches new international students with trained Canadian students
- language services—ESL classes, English tutorials, language exchange
- wellness programs—regular fitness classes, sports, social, intellectual and cultural activities
- special programs for spouses and family members
- re-entry workshops—preparation for return to home countries and debriefing sessions for UBC students returning from exchanges

Communication

- bimonthly newsletter, "International Campus"
- professional staff are available for one-on-one advising or group meetings by appointment

International Opportunities Library

This is a self-help resource library providing information about:

- study abroad and student exchange opportunities
- overseas volunteer/work positions
- international development
- scholarships, grants, awards for international research/studies
- preparation for overseas experience

Social/Cultural Programs

- Gate 4 Lounge – Through the operation of a licensed lounge, International House is kept open beyond regular office hours to provide a friendly meeting place on campus after class.
- Special Events – Special events such as cultural performances, social dances, international food fairs and multicultural festivals are organized frequently by either ISS or users of the facilities at International House. These events are usually open to everyone.

Facilities

The following facilities at International House are available to users through advance booking:

- lounges and meeting rooms for social functions, seminars, conferences and workshops
- stage with lighting equipment
- stereo system
- adjacent gardens and wooded areas for outdoor activities such as barbecues
- bar service

Advocacy

International Student Services works closely with other University departments, community groups, government agencies and national and international organizations involved in international education. We identify and articulate issues in international education and the concerns of international students, and lobby for government policy changes.

Contractual Services

International Student Services provides special services required by sponsored trainees and students on development and scholarship programs funded by agencies such as CIDA, the UN, or foreign governments. The level of services is negotiated through contracts with the funding agencies.

Library

– see **The University Library**

The Morris and Helen Belkin Art Gallery

Director/Curator: Scott Watson
Program Coordinator: Mary Williams
Technician/Preparator: Owen Sopotniuk

The Morris and Helen Belkin Art Gallery houses the University art collection and an important archival research institute. The Gallery mounts a program of exhibitions and special events related to issues in contemporary art. It is located at 1825 Main Mall in an award-winning new building designed by Peter Cardew.

Hours

September to April: Tuesday to Friday, 10 am to 5 pm
Saturday, 12 pm to 5 pm
May to August: to be announced

Museums

Museum of Anthropology

MICHAEL M. AMES, B.A. (Brit. Col.), Ph.D. (Harv.), F.R.S.C., Director.
MARJORIE M. HALPIN, M.A. (George Washington), Ph.D. (Brit. Col.),
Curator of Ethnology.
J. E. MICHAEL KEW, B.A. (Brit. Col.), Ph.D. (Wash.), Curator of Ethnology.

LOUISE M. JACKSON, B.A. (Lond.), M.A. (Mich.), Ph.D. (Calif., Los Angeles), Curator of Ethnology.

R. G. MATSON, B.A. (Calif., Riverside), Ph.D. (Calif., Davis), Curator of Archaeology.

MIRIAM CLAVIR, B.A. (Tor.), M.A. (Queen's), Honorary Lecturer, Conservator.

The Museum of Anthropology was founded in 1947 and now contains about 150,000 archaeological artifacts and 30,000 ethnographic artifacts. Of these, the Northwest Coast collection is outstanding, consisting of a broad ethnographic range of materials, both ceremonial and domestic, some donated and others purchased with grants made by Dr. H. R. MacMillan, Dr. Walter C. Koerner and the Leon and Thea Koerner Foundation.

The Oriental collections are extensive and include gifts made by the Fyfe-Smith family and items purchased by them to extend the range of materials to illustrate the history of Japanese and Chinese Art. Also included are gifts from the late Mr. and Mrs. B. E. Clegg, the Japanese Association of Prefectural Governments, and Dr. and Mrs. Miguel Tecson.

Classical materials of Greece, Cyprus, and Rhodes are mainly from the gift of Mrs. Sid Leary and the Baroness Van Haersolte.

The collections in the Laboratory of Archaeology are primarily the result of four decades of UBC faculty and student research in south western British Columbia.

Artifacts gathered before 1914 from the domestic and ceremonial life of the Oceanic cultures were the gift of Mr. Frank Burnett.

A major donation of 600 pieces of 15th - 19th century European ceramics by Dr. Walter Koerner is featured in a ceramics gallery, located in the west wing, which opened in 1990. The addition of this collection to the Asian, Central and South American, and European ceramics already represented in the Museum provides a unique resource in Canada for ceramics research. The wing also contains teaching and research spaces.

Collections from North American Native cultures are reasonably extensive and the Inuit material from the Coppermine River area, much of which was collected by Michell Pierce in 1930, is excellent. The Inuit collections have grown substantially through recent acquisitions.

These collections are used in teaching, especially in museum training courses, and in various anthropology courses as well as courses in other disciplines. They are also resources for research work by students and scholars.

The Museum of Anthropology moved to new premises on May 30, 1976. The building was part of a Centennial gift from the federal government to the people of British Columbia to allow the University to "share the collections of the UBC Museum of Anthropology with the public" and "house the additional gift of the Indian art collection of Walter and Marianne Koerner of Vancouver." The spectacular building enhances the Museum's collection of massive carvings of the Northwest Coast, and permits the public display of most of its ethnographic collections in the visible storage galleries.

The operations and programs of the Museum are funded in part by the Government of Canada through the Museums Assistance Program of the Department of Canadian Heritage and by the Government of British Columbia through the Ministry of Small Business, Tourism and Culture.

The Museum is located at 6393 N.W. Marine Drive.

The M. Y. Williams Geological Museum

J. J. NAGEL, B.Sc. (Calif.), M.Sc. (Brit. Col.), Curator.

Located on the first floor of the Geological Sciences Centre, the museum includes displays of spectacular rocks, minerals and fossils. This exhibit is the only one of its kind in British Columbia, and displays are changed periodically.

The most prominent display is the wall-mounted example of the dinosaur *Lambeosaurus*. This animal, 80 million years old, occupies a permanent position just inside the door. Collected in southwestern Alberta in 1913, this dinosaur illustrates a number of features peculiar to the hadrosaurs or hooded dinosaurs. These were common in some parts of Canada during the Upper Cretaceous Period.

Minerals, rocks and fossils are drawn from departmental collections which total approximately 40,000 items. Geological specimens are unusual in that they have aesthetic appeal over and above their scientific interest. It is this fact which makes the displays especially interesting to the layperson.

The museum, located on the first floor of the Geological Sciences Centre, is open to the public Monday to Friday, 8:30 am to 4:30 pm. Group visits can be arranged by calling the department secretary at (604) 822-2449. A "Friends of the Museum" group meets a number of times each year. A collector shop carries a superb assortment of minerals and fossils for collectors. For those with an interest in geology, further details can be obtained from the curator at (604) 822-5586.

Herbarium

G. B. STRALEY, B.S. (Virginia Polytech.), M.S. (Ohio), Ph.D. (Brit. Col.), Director of the Herbarium and Curator of Vascular Plant Collections.

R. J. BANDONI, B.S. (Nevada), M.S., Ph.D. (Iowa), Curator of the Mycological Collections.

T. GOWARD, B.A. (McAll.), Asst. Curator of the Lichen Collections.

H. KENNEDY, B.S., M.S., Ph.D. (Calif., Davis), Asst. Curator of the Vascular Plant Collections.

S. C. JINDSTROM, B.S. (Reed), M.Sc., Ph.D. (Brit. Col.), Assistant Curator of the Physiological Collections.

R. F. SCAGEL, M.A. (Brit. Col.), Ph.D. (Calif.), F.R.S.C., F.L.S., Curator of the Physiological Collections.

W. B. SCHOFIELD, B.A. (Acadia), M.A. (Stan.), Ph.D. (Duke), Curator of the Bryophyte Collections.

The Herbarium consists 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 over 215,000 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 the late 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, South America, the Hawaiian Islands, New Zealand and Australia.

The Physiological Collections comprise over 80,000 specimens of marine algae. They are rich in species from British Columbia, Washington, Oregon, Alaska and major representations from Australia, New Zealand, Europe, Japan and South Africa. Collections were made in research projects supported in part by grants from the Natural Science and Engineering Research Council and the Defence Research Board to the Department of Oceanography and the Department of Botany.

The Mycological Collections comprise over 38,000 specimens of fungi. This includes an excellent collection of

Myxomycetes as well as representatives of most groups of true fungi.

The Bryophyte Collections contain the largest and most complete collection of British Columbia bryophytes in existence. It is well represented by material from other Canadian Provinces, Japan, U.S.A., Latin America, Western Europe, Australia and New Zealand. The collection has been built as a direct result of sponsorship by the National Science and Engineering Research Council. The collections of bryophytes contain over 204,000 specimens, of which over 169,000 are mosses and 35,000 are hepatics, and the lichen collections contain over 30,000 specimens.

The collections are available for study to students and research institutions.

Zoological Museum

G. G. E. SCUDDER, B.Sc. (Wales), D.Phil. (Oxon), F.R.S., F.E.S.C., F.R.S.C., Curator of the Spencer Entomological Museum.

J. D. MCPHAIL, M.Sc. (Brit. Col.), Ph.D. (McG.), Curator of Ichthyological Museum.

J. N. M. SMITH, B.Sc. (Edin.), D.Phil. (Oxon), Curator of the Cowan Vertebrate Museum.

The Zoological Museum contains material representative of both vertebrate and invertebrate taxa. It is housed in several rooms in the Biological Sciences building.

The Cowan Vertebrate Museum contains 13,490 specimens of mammals, 14,300 birds, 6650 bird eggs, and 1511 amphibians and reptiles. Major accessions include the K. Racey collection of birds and mammals, the H. R. Macmillan bird collection, and the zoological collections of W. S. Maguire and J. Wynne. Major geographical representation is British Columbia.

The George J. Spencer Entomological Museum now contains about 600,000 specimens mostly from British Columbia and the Yukon. Notable holdings include the Stace-Smith Collection of Coleoptera, the Foxlee collection of Diptera and Hymenoptera, the Downes collection of Hemiptera, and the Llewellyn-Jones collection of Lepidoptera.

The Ichthyological Museum has one of the two largest collections of fish in Canada with over 23,000 catalogued entries comprising over 800,000 specimens. Fifty percent of the collection is from North America and the remainder from throughout the world. In addition to preserved specimens, the collection is rich in skeletal and x-ray material. The data base is amenable to computer manipulation, permitting searching for specific geographical areas and/or faunal associations.

The limnological collection contains a large number of plankton and bottom fauna samples from several hundred lakes in British Columbia.

The Norman MacKenzie Centre for Fine Arts

The Norman MacKenzie Centre for Fine Arts, named in honour of UBC's President from 1944 to 1962, is a tribute to his continuing interest in the arts throughout his career as one of Canada's leading educators. The Centre, dedicated in September, 1965, is comprised of the following buildings: the Frederic Lasserre Building, named for the founding director of the University's School of Architecture from 1946 to 1961, which provides facilities for faculty members and students in the Architecture School, the School of Community and Regional Planning and the Department of Fine Arts; the Music Building, which contains a variety of facilities for training students as instrumentalists, composers, singers and music teachers and a

289-seat recital hall for public performances; the Frederic Wood Theatre, named for "Freddy" Wood, who taught at UBC from 1915 to 1950, which houses the University's Department of Theatre and includes two theatres, one seating 400 for major theatrical and musical productions and the Dorothy Somerset Studio, named for the founding head of the Theatre Department and a UBC faculty member from 1938 to 1965, which seats 80 persons; and the Morris and Helen Belkin Art Gallery (see above).

North East Pacific Culture Collection of Marine Phytoplankton

F. J. R. TAYLOR, B.Sc. (Hons.), Ph.D. (Cape T.), Director.
E. P. SIMONS, B.Sc., M.Sc. (Calg.), Curator.

The North East Pacific Culture Collection (NEPCC) originated in the late 1960's in the Department of Oceanography under the administration of Dr. F. J. R. Taylor. It is housed in the Biological Sciences Building in Department of Oceanography.

The NEPCC is registered with the World Federation for Culture Collections and receives partial financial support from the Natural Sciences and Engineering Research Council. It is, with respect to marine phytoplankton, the only one of its kind in Canada and is one of the most comprehensive in the world. Approximately 335 isolates (197 species) are currently in culture and all of the major algal groups appearing in the marine phytoplankton are represented. The major emphases are on local species of ecological and toxicological importance and those which may be of importance in biotechnology. Currently, 75% of the isolates are from B.C. waters and the remainder are from tropical and other temperate regions. A unique feature of the NEPCC is the inclusion of various species of oceanic microflagellates isolated from the north east Pacific. The dinoflagellate collection is one of the largest in the world.

Cultures are supplied to for teaching, research and commercial purposes at UBC and worldwide. A nominal fee is charged to cover processing costs, unless an exchange of cultures can be arranged. Further information, including a current list of species in culture and relevant technical data, is available from the curator; telephone (604) 822-1378.

Parking and Security Services

Regulation of parking is enforced on the campus. Maps outlining parking regulations are available at the Traffic Office at 6501 N.W. Marine Drive. 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.

"B" lots provide inexpensive daily parking for all members of the University and parking permits are sold at the Traffic Office to allow faculty, students and staff members to park their vehicles in various registered-vehicle parking lots. Pay parking lots and parking meters are provided for campus visitors.

Further information on parking is available by telephone at (604) 822-6786. The 24-hour general information line can be reached at (604) 822-2222.

Public Affairs Office

This Office provides a comprehensive communications program directed toward the campus community, the general public, government, the business community and the media. The primary goals of the office are to keep the campus community informed about developments in university policies, research, teaching, staff and events, increase public understanding and support for UBC, encourage public use of campus facilities and attractions, and promote interaction between the University and the private and public sectors. The office provides the news media with accurate and timely information about research activities and other matters of public interest, produces a wide range of publications including the tabloid newspaper *UBC Reports*, *President's Reports*, and brochures. Staff also provide public and media relations counselling to UBC administrative and academic units and offer consultation services to campus units. The Public Affairs Office can be reached at (604) 822-3131.

Publications

UBC Press

UBC Press was founded in 1971 and publishes works written not only by UBC faculty but also by faculty from other Canadian and non-Canadian universities and by non-academic authorities in their fields. Its books are distributed throughout the world by a network of scholarly book distributors. Books published by UBC Press are subject to peer review and must be approved for publication under the University's imprint by a committee of faculty members appointed the President.

The Press is a major distributor of university press books acting as Canadian distributor for the university presses of the following universities: Alberta, Calgary, Washington, Nevada, Utah and Colorado. It also provides book production and distribution services to the UBC community and other British Columbia institutions.

Recently published books include *Killer Whales: The Natural History and Genealogy of Orcinus orca in British Columbia and Washington State*; *Shorebirds of the Pacific Northwest*, by Dennis Paulson; *Bats of British Columbia*, by David W. Nagorsen and R. Mark Brigham; *Objects of Concern: Canadian Prisoners of War through the Twentieth Century*, by Jonathan Vance; *Decision at Midnight: Inside the Canada-US Free Trade Negotiations*, by Michael Hart, Bill Dymond, and Colin Robertson; *Eagle Down Is Our Law: Witsuwit'en Laws, Feasts, and Land Claims*, by Antonia Mills; *Taking Control: Power and Contradiction in First Nations Adult Education*, by Celia Haig-Brown; *Comparing the Policy of Aboriginal Assimilation: Australia, Canada, and New Zealand*, by Andrew Armitage; *Tannamutit (Mistakes): Inuit and Relocation in the Eastern Arctic 1939-63*, by Frank Tester and Peter Kulchyski; *Gold at Fortymile Creek: Early Days in the Yukon*, by Michael Gates; *The Klondike Stampede*, by Tappan Adney; *Morals and the Media: Ethnics in Canadian Journalism*, by Nick Russell; *Haida Monumental Art: Villages of the Queen Charlotte Islands*, by George MacDonald; *The Domestic Assault of Women: Psychological and Criminal Justice Perspectives*, by Donald G. Dutton; *Roasting Chestnuts: The Mythology of Maritime Political Culture*, by Ian Stewart; *Britain and the Origins of Confederation 1837-67*, by Ged Martin; *Retinking Federalism: Citizens, Markets, and Governments in a Changing World*, edited by Karen Knop, Sylvia Ostry, Richard Simeon, and Katherine Swinton; *Retinking International Relations*, by Fred Halliday; *Physiological*

Ecology of Pacific Salmon, edited by Cornelis Groot, Leo Margolis, and W. Craig Clarke; *Glacial Environments*, by Michael J. Hambrey; *The Causes of Tropical Deforestation*, edited by Katrina Brown and David Pearce; and *Demographic Projection Techniques for Regions and Small Areas: A Primer*, by H. Craig Davis.

The UBC Press offices are located in the Old Auditorium on campus. They house the Press's editorial, marketing, production and book-ordering facilities. An eastern office is located at 167 Kingston Road, Toronto Ontario M4L 1T1; telephone (416) 690-6061 fax (416) 690-4191. Shipping and warehousing are located at 8591 Fraser Street; telephone (604) 327-6591, fax (604) 327-1009 (e-mail: warehouse@ubcpress.ubc.ca).

Queries about publication should be addressed to R. Peter Milroy, Director (604) 822-3807 (e-mail: r.p.milroy@ubc.ca), Jean Wilson, Senior Editor (604) 822-6376 (e-mail: jean.wilson@ubc.ca) or Laura Macleod, Acquisitions Editor (416) 690-6061 (e-mail: lmacleod@unix.ubc.ca).

Information and catalogues of recently published books and of all books in print are available from UBC Press, 6344 Memorial Road, Vancouver, B.C., Canada, V6T 1Z2. Complete electronic books-in-print listings and other information about the Press is available on ViewUBC under UBC Publications; telephone (604) 822-3259, fax (604) 822-6083 (e-mail: orders@ubcpress.ubc.ca).

B.C. Asian Review

Editors: Philip Clart and Colin Hawes

The B.C. Asian Review is a refereed annual journal of graduate research on intellectual, political and historical topics; textual studies in both ancient and contemporary sources; literary pieces, translations, and reviews. Copies can be purchased through the Department of Asian Studies, Asian Centre, 1871 West Mall, UBC, Vancouver, B.C. V6T 1Z2.

Canadian Literature

A Quarterly of Criticism and Review.

Editor: William H. New

Associate Editors: L. Ricou and E. M. Kröller

This journal serves as a continuing symposium on the nation's literature and on literature in its relation to society. The journal also contains reviews of all significant Canadian literary works.

The Canadian Yearbook of International Law

Editor: D. M. McRae

The Yearbook presents contemporary thought and practice in the field of international law. Each edition investigates some recent legal and policy changes of states and of international organizations. Particular topics and their legal status are also discussed. Sections dealing with Canadian practice in international law as reflected in public statements and correspondence, treaties, and judicial decisions are included each year.

The Yearbook, published since 1963, is issued under the auspices of the Canadian Branch of the International Law Association and the Canadian Council on International Law. It is distributed by the University of British Columbia Press.

Pacific Educational Press

Pacific Educational Press is a publishing house located within the Faculty of Education. It has been publishing

progressive educational materials for students and teachers since 1971. Over 125 titles have been published, and over 75 titles are currently in print. They include student books for use in elementary and secondary schools, teacher guides written to accompany the student books and to help teachers plan teaching units on certain topics, and audio-visual materials to enhance programs of study. The press also publishes materials for use by university students of education, teacher resource books, and scholarly works in the discipline of education. Ongoing series of the press focus on environmental and science education, native studies, fiction for young readers, multicultural books, and music education. Recent titles include *Sima Come Join Me*, a book on Native Canadians designed for use in Grade 4 social studies, *Wild Trees of British Columbia*, a field guide and reference work for science students and general use, and *Education in the Third Age: Canadian and Japanese Perspectives*, a scholarly anthology of papers on education of older people in Canada and Japan.

Pacific Educational Press's offices are in Hut O-4, behind the Scarfe Building. Information about the press or any of its titles can be obtained by writing to Pacific Educational Press, Faculty of Education, University of British Columbia, V6T 1Z4, or by telephoning (604) 822-5385, or faxing (604) 822-6603.

PRISM international

Editor: Shelley Darjes

Executive Editor: Greg Nyte

Advisory Editors: Keith Maillard and George McWhirter

PRISM international is a literary journal published by the department of Creative Writing, featuring poetry, fiction, drama, creative non-fiction, and translation by emerging and established authors from around the world. 1994 marks PRISM's thirty-fifth anniversary, making it Western Canada's oldest literary magazine. Since 1978 editorial staff has been drawn from the graduate students of the Department of Creative Writing.

PRISM international; Creative Writing. Quarterly; individual subscription rates: one year \$16, two years \$24. Annual Short Fiction Contest: deadline December 31 of each year, first prize \$2,000.

Studies in Medieval and Renaissance History

Editors: J. A. S. Evans and R. W. Unger

UBC's Committee for Medieval Studies has published the new series of *Studies in Medieval and Renaissance History* since 1978. Volume VII and succeeding volumes are published in cooperation with AMS Press, New York.

Registrar's Office

The Registrar's Office provides information on admissions (undergraduate), examination clashes/hardships, fees, graduation, Guided Independent Study courses (registration, examination, fee inquiries), registration, review of assigned standing, supplemental/deferred examinations, and transfer credit.

The office processes address and name changes; issues transcripts; and produces and distributes publications including the *Calendar*, *Registration Guide* and *Undergraduate Admissions Guide*.

The mission of the Registrar's Office is to help students achieve their academic goals and to support the university community by providing efficient, friendly, quality service. Its vision is to create a supportive environment where employees take pride in their work and consistently exceed customers' expectations.

The Registrar's Office is located in Brock Hall, 2016-1874 East Mall, Vancouver, BC, V6T 1Z1. Office hours are 8:00 am to 4:00 pm Mondays, Thursdays and Fridays; 9:30 am to 4:00 pm on Tuesdays; and 8:00 am to 7:00 pm on Wednesdays. General inquiries can be directed to (604) 822-2844. Inquiries concerning undergraduate admissions can be e-mailed to Registrar.admissions@ubc.ca or directed to (604) 822-3014; fax (604) 822-3599. Records inquiries can be sent to Registrar.records@ubc.ca.

Student Information System (SIS)

Call the Student Information System at (604) 280-8228 for:

- TELEREG and Fee Inquiry
- Grades Inquiry
- PIN change

Regular hours of operation are 8:00 am to 9:00 pm Monday to Friday, and 9:00 am to 4:00 pm on Saturdays and Sundays. In September, the SIS is available between 8:00 am and 8:00 pm Monday to Friday.

Student Access Kiosks

Use a student access kiosk, located outside the Registrar's Office in Brock Hall to:

- Change your address
- Order transcripts
- View your courses and grades

The Rick Hansen National Fellow Program

RICK HANSEN, C.C., O.B.C.

The Rick Hansen National Fellow Program was established to perpetuate the ideals and values of Rick Hansen and the Man in Motion World Tour, and to support national and international advocacy as it relates to persons with disabilities. The National Fellow Program focuses on all areas of society and provides a positive influence for social change in Canada and throughout the world.

The Rick Hansen National Fellow Program is financed by an endowment from the Federal Government and the Province of British Columbia. The offices are in the Disability Resource Centre, currently located in Room 1040, Brock Hall, 1874 East Mall. For information please call the Rick Hansen National Fellow Program at (604) 822-4433.

The Student Health Service

The Student Health Service is located in the Acute Care Unit, Vancouver Hospital and Health Sciences Centre (UBC Site). The reception room is located on the Main Floor, Room N334; telephone (604) 822-7011. Clinic hours are 8:00 am to 4:00 pm on Monday, Tuesday, Wednesday, and Friday, and 8:45 am to 4:00 pm on Thursday. There is an Emergency Department in the Acute Care Unit where help is available for acute injuries or sudden illness, when the Health Service is closed.

The Student Health Service is available for the use of all currently registered UBC students who are taking credit courses. The unit is staffed by qualified personnel and is not part of the teaching facility of the University Hospital.

Services include care of illness or injury, psychiatric services, preventive medicine, counselling, antigen and immunization administration. When necessary, hospitalization will be arranged in a hospital, either on or off campus, depending on the type of facility required.

Medical Requirements for Registration

The University reserves the right to insist upon a medical examination if circumstances warrant.

Routine Regarding Absence due to Sickness and Injury

1) Students absent from December or April examinations must submit a Request for Academic Concession form to the Dean of their Faculty or Director of their School as soon as possible. These forms are available from the Dean's or Director's office. The request should be accompanied by a Statement of Illness form completed by either the attending Student Health Service physician or the attending family physician.

Academic concessions are granted only by the Dean or Director (or their delegate) and are a privilege not a right. The student may be asked to provide additional information.

2) Students absent at other times because of illness should report their absence to their instructors. If they wish to request academic concession, they should follow the procedure outlined in point 1 above.

General Information on Medical and Hospital Insurance

- 1) Hospital Insurance
 - a) Students who are classified as residents of B.C. are entitled to B.C. Hospital Insurance benefits.
 - b) Students who are not classified as residents of B.C. are not eligible for payment of hospital costs under the British Columbia Hospital Service. Please make enquiries regarding eligibility for residents at BCHIS office; telephone (604) 660-2406.

All Canadian provinces accept responsibility for hospital costs for their students attending The University of British Columbia provided the hospital insurance premiums (where required) have been paid.

2) Sickness Insurance
It is advisable for all B.C. residents to have coverage under the Medical Services Plan of B.C. Unmarried students whose parents are enrolled in the M.S.P.B.C. are insured as dependants until their nineteenth birthday. The coverage may be continued until the student's twenty-fifth birthday if the student is in full-time attendance at university and mainly dependent on his or her parents, but the Plan must be notified of these facts each September, otherwise coverage ceases on the nineteenth birthday.

For students who are not covered by their parents' medical insurance plan, coverage under the Medical Services Plan of B.C. is available. Students covered by this Plan as individual subscribers may be eligible for a subsidy.

Students who have not established residency (see General Information on Medical and Hospital Insurance, item 1b above) are not able to purchase this plan. Coverage should be maintained in the home Province.

Non-Canadian students are strongly advised to have adequate hospital/sickness insurance coverage. A three-month coverage should be obtained, either in their country of origin or immediately upon arrival in British Columbia. After three months, those on either student or working visas may be eligible for the Medical Services Plan of British Columbia. (Application should be made on arrival)

Application forms for medical insurance coverage are available at your Student Health Service and enquiries are always welcome. Please feel free to drop into the clinic when you arrive and meet our staff (see paragraph 1).

For further details consult the Health Service or the Medical Services Plan of B.C., telephone (604) 669-4211, New Enrolment Office or write to M.S.P.B.C., 1410 Government Street, Victoria, B.C., V8W 1Z2.

Students who allow their insurance to lapse will be billed directly.

The following Faculties and Schools have special requirements; please see the appropriate *Calendar* section:

- Faculty of Medicine and School of Rehabilitation Sciences
- Faculty of Dentistry
- School of Nursing — undergraduate and graduate programs

Student Housing

On-Campus Accommodation

- **Winter Session** — Furnished residence accommodation is available for single students during Winter Session from August 31 to April 30 on a room-and-board basis in Place Vanier and Totem Park Residences, or on a room-only basis in Walter H. Gage Residence or Ritsumeikan-UBC House. Year-round, room-only, furnished accommodation for senior students is available in the Fairview Crescent townhouses. The Housing Department's application process is entirely separate from the University's admissions system, so students should not wait until they are admitted to UBC before applying for housing. Information booklets, application forms and rate sheets for Place Vanier, Totem Park, Walter Gage, Ritsumeikan-UBC House, and Fairview Crescent Residences are available from the Housing Office, The University of British Columbia, Brock Hall, 1874 East Mall, Vancouver, B.C. V6T 1Z1, or telephone (604) 822-2811, fax (604) 822-6935. The office is open Monday to Friday, 8:30 am to 4:00 pm and is closed on weekends and statutory holidays.
- **Year Round** — The newly opened Thunderbird Residence is designed for single students and couples requiring unfurnished, year-round on-campus accommodation. These units are assigned to graduate students, students registered in professional programs and mature students. Thunderbird Residence also has 72, four-bedroom, furnished townhouses which are assigned to students on a first-come-first-served basis on a year-round contract. Information specific to Thunderbird Residence should be requested separately from Winter Session accommodation information. Please write to: Thunderbird Residence Assignments, UBC Housing Office, Brock Hall, 1874 East Mall, Vancouver, BC, Canada V6T 1Z1; telephone (604) 822-2812, fax: (604) 822-6935.
- **Student Family Accommodation** — Five hundred and thirty-one unfurnished apartments and townhouses are available on a yearly tenancy basis in the Acadia Park development, for couples with or without children. Families should apply to Family Housing, The University of British Columbia, Brock Hall, 1874 East Mall, Vancouver, B.C. V6T 1Z1 or telephone (604) 822-4411, fax (604) 822-6935.
- **Faculty/Staff Accommodation** — Two hundred sixty-eight unfurnished apartments are available on a yearly tenancy basis in Acadia Park for singles and couples with or without children. Faculty and staff applicants should apply to Faculty/Staff Housing, The University of British Columbia, Brock Hall, 1874 East Mall, Vancouver, B.C., V6T 1Z1, or telephone (604) 822-4411, fax (604) 822-6935.

Residence Advisers

Some employment positions as Residence Advisers are offered each year to students who have demonstrated ability to relate well to others in a community environment, to maintain high academic standards, and to participate actively in student life in residence. Application forms and detailed job descriptions are available in early January at the Housing Office or at the Residence Front Desks. Personal interviews are necessary.

Additional On-Campus Accommodation

Green College is a residential graduate college. For further information see Graduate Studies section of the *Calendar*.

Theological Colleges provide a limited number of beds in the following residences. Contact the Dean of Residences directly.

Carey Hall, Baptist (Men and Women)	224-1308
St. Andrew's Hall, Presbyterian (Men and Women)	822-9720
Vancouver School of Theology (Men and Women)	228-9031

Off-Campus Accommodation

International Student Centre (International House) and the Graduate Student Centre have listings of off-campus accommodation available to students on their notice boards.

The Alma Mater Society (AMS) recently created a new off-campus housing registry, the **AMS RentsLine**[®]. This is a computerized telephone registry that is open to landlords and students 24 hours a day, providing up-to-date information on off-campus housing availability. It can be used from any touch-tone telephone in the world. Students seeking accommodation may call (604) 822-9844; local calls are free of charge.

Landlords wishing to advertise space for rent may call 1-900-451-5585 to post a voice listing. There is a fee of \$20 for this service. Students seeking roommates may call (604) 822-9844 to post a voice listing. A pass code is required to access this service. Pass codes can be obtained for a fee of \$5 at the AMS box office between 9:30 am and 5:00 pm, Monday through Friday. Listings will stay on the system for two weeks.

RentsLine[®] is a trademark of Career VoiceLINK, Inc., Orinda, CA.

Student Resources Centre

Career Services

Career Services links students and alumnae with employers and employment opportunities through JobsLine, a state-of-the-art electronic touchtone telephone system. Resume preparation, job search and interview skills expertise are available from experienced staff. Call the 24-hour JobsLine at (604) 822-8668 for registration information, employment listings and career events announcements.

For further information, contact Career Services, Student Resources Centre, The University of British Columbia, Brock Hall Room 307, 1874 East Mall, Vancouver, B.C., V6T 1Z1. Telephone: (604) 822-0111. Office hours are 8:30 am to 4:30 pm, Monday to Friday.

Counselling Services

Counselling Services provides free, confidential counselling for students attending UBC. Psychologists and professional counsellors are available to work individually with students to help them address personal, relationship, career or educational concerns. Counselling appointments may be made by calling or dropping by Counselling Services.

In addition to individual counselling, Counselling Services offers counselling groups and skill-based workshops throughout the year. Counselling Services also houses a reference library containing career, international opportunities and self-help information, corporation files, calendars from other universities and past exams.

For further information, contact Counselling Services, Student Resources Centre, The University of British Columbia, Brock Hall Room 200, 1874 East Mall, Vancouver, B.C., V6T 1Z1. Telephone: (604) 822-3811. Office hours are 8:00 am to 4:30 pm, Monday to Friday.

Health Education Outreach

A Health Education Coordinator organizes a health education outreach program which runs throughout the Winter Session. The program includes a variety of health awareness events and workshops. More information is available from the Health Education Coordinator, Student Resources Centre, The University of British Columbia, Brock Hall Room 200, 1874 East Mall, Vancouver, B.C., V6T 1Z1. Telephone: (604) 822-4858.

School and College Liaison Office

The School and College Liaison Office provides information services and programs for counsellors and prospective UBC students from Canadian secondary schools and colleges. Counsellors and students with inquiries about undergraduate programs, admission requirements, awards and financial aid, student housing and other student services at UBC are encouraged to contact the office.

Liaison Office representatives visit B.C. secondary schools and colleges each year to meet with prospective UBC students. The Office also arranges visits to UBC for groups of secondary school students on request from counsellors or teachers. Individual students can arrange to take a guided walking tour of campus most Fridays throughout the year by calling the Liaison Office. The Office also offers programs and services to help new undergraduate students make the transition to university.

For more information, contact the School and College Liaison Office, Student Resources Centre, The University of British Columbia, Brock Hall Room 206, 1874 East Mall, Vancouver, B.C., V6T 1Z1. Telephone: (604) 822-4319. Office hours are 8:30 am to 4:30 pm, Monday to Friday.

UBC Food Group

The UBC Food Group (formerly University Food Services) has been in operation since its formation in 1949. The Department has facilities located throughout the campus to provide a variety of services to students, faculty, staff and visitors to the University. It is comprised of over twenty operations including Residence Dining Rooms, Cafeterias, a full service Restaurant, Convenience Stores, and a complete Catering Service. The UBC Food Group is a major employer with over four hundred employees.

UBC Food Group locations are:

- **Acadia Mini Mart** — Convenience store for Fairview residents. Everything from milk and bread to gummy bears. Open Monday to Friday 9 am to 9 pm and on weekends from 11 am to 6 pm; telephone (604) 822-6497.
- **Arts 200** — Convenient service for quick in-between class snacks. Located in Buchanan Lounge in Room 200. Open during the winter and summer sessions from Monday to Friday; telephone (604) 822-2002.
- **Barn Coffee Shop** — Meet your friends for a quick break or grab a hot lunch at this south campus outlet. We have a grill, custom sandwich bar and a variety of

snacks and beverages. Cozy atmosphere on the inside or outdoors on the patio. Open Monday to Friday; telephone (604) 822-3651.

- Gage Mini Mart – Convenience store for Gage residents. Handy for essentials as well as frozen entrees and other quick meals. Open Monday to Friday 10:30 am to 10:30 pm and on weekends 11:30 am to 6:30 pm. Caters to the Conference Centre from May until August; telephone (604) 822-5494.
- Hubbards – Early and late night eatery conveniently located at the lower level of Place Vanier. We provide snacks and convenience store items. Open seven days a week; telephone (604) 822-5805.
- IRC Snack Bar – Efficient, cheerful staff provide convenient take-out service for beverages, snacks, sandwiches, baked goods and hot soup. In the heart of the Medical Block, at the Instructional Resources Centre lounge. Open Monday to Friday; telephone (604) 822-4291.
- Magdas – Snack Shop and Convenience Store located at the lower level of Totem Common Block. Open seven evenings a week; telephone (604) 822-4221.
- Place Vanier Dining Room – Warm, cheerful atmosphere open for Place Vanier residents as well as non-residents. Open seven days a week; telephone (604) 822-2622.
- The Ponderosa – Meet your friends in the Ponderosa by the big ponderosa pine located on the corner of West Mall and University Boulevard. Salads, burgers, snacks, custom sandwich bar, and hot entrees. Open Monday to Friday; telephone (604) 822-2372.
- Roots – Tucked away in the MacMillan Building lounge, this snack bar is a favorite of Foresters and Aggies. Open Monday to Friday; telephone (604) 822-6118.
- Pacific Spirit Place – UBC's largest cafeteria located on the main level of the Student Union Building. Extensive and exciting menu selection, including a mega salad bar, custom sandwiches, Asian food, pizza, vegetarian specials, pastas, snacks and short orders. Watch for daily entree specials. Open Monday to Friday; telephone (604) 822-3461.
- Totem Park Dining Room – Bright and colourful facilities make dining a pleasure for Totem Park residents as well as non-residents. Come in for full meals, snacks, beverages, custom sandwiches, salads and much more. Telephone (604) 822-6828.
- Trekkers & the Express – Located at the David Lam Management Research Library on the Main Mall. Enjoy full restaurant service at Trekkers or take-out from the Express. Monday to Friday; telephone (604) 822-3256.
- UBC Catering – Full catering services for the University community. We offer a wide range of services including coffee break drop-offs, luncheons, banquets, teas, receptions, weddings, barbecues and wine and cheese parties. Office is located in the Ponderosa Building; telephone (604) 822-2018.
- Underground – Studying in the library and need a break? Located in the lobby of Sedgewick Library, we provide snacks to those wanting a break from the stacks and carrels. Open Sunday to Friday; telephone (604) 822-6867.
- Yum Yums – Craving authentic Chinese food? Yum Yums in the Old Auditorium offers delicious meals cooked in big woks right on the premises. New menu items are continually being introduced by our talented cooks. Open Monday to Friday; telephone (604) 822-2569.

Administration Office

The central administration office is located at 2071 West Mall in the Ponderosa Building. For information call (604) UBC-FOOD or (604) 822-3663.

The University Bookstore

The UBC Bookstore is the largest bookstore in Western Canada, and one of the largest in North America. It is owned and operated as an ancillary operation by the University of British Columbia. The Bookstore is open to the general public, as well as to students, faculty and staff. Everybody is welcome.

The UBC Bookstore operates in two locations: the main campus store, and the Health Sciences Bookshop. The campus store offers everything from required course books to computers, sportswear to gift items. The Bookstore is the major academic bookstore in British Columbia and regularly stocks over 100,000 general and academic book titles.

The campus store is open Monday to Friday 9:00 am to 5:00 pm, Saturday 10:00 am to 5:00 pm. During the first week of classes, in September and January the campus store hours are extended to 8:30 pm on Tuesday, Wednesday and Thursday evenings. Hours are posted at the Bookstore and are subject to change. The Health Sciences Bookshop is open Monday to Saturday 10:00 am to 5:00 pm.

The campus store is located at 6200 University Boulevard Vancouver, B.C. V6T 1Z4; telephone (604) 822-2665 (UBC-BOOK), toll-free in Canada 1-800-661-3889, fax: (604) 822-8592. Please refer to listings below for direct phone/fax numbers for individual areas.

The Health Sciences Bookshop is located at 2750 Heather Street, Vancouver, B.C. V5Z 4M2; telephone (604) 875-5588, toll-free order line in B.C. 1-800-665-7119, fax (604) 875-5590.

Bookstore information can be accessed on the Internet through the View UBC gopher at view.ubc.ca (port is 70) or via the World Wide Web at <http://view.ubc.ca/>. Electronic orders can be placed via e-mail at bkstore@unix.ubc.ca

The Bookstore accepts cash, personalized cheques, Visa, Mastercard and debit cards. The Bookstore will also accept parent's cheques and credit cards, accompanied by a letter of authorization from the parent and proper student identification. Orders and payment accepted by phone, mail or Internet. Call us for details.

Merchandise is returnable for refund or exchange within 14 days of purchase. Sales receipt must be presented, and merchandise must be in resaleable condition. No refunds or exchanges are given on special orders, computer hardware or software, postal services, sale items and items which cannot be accepted due to health regulations. Course book refund deadlines are extended at the beginning of each new term to the end of the add/drop period; specific dates are posted in the Bookstore.

Book Information

The Bookstore stocks all course texts and materials, as well as over 85,000 titles in general and reference books, including bestsellers and children's books. Book information is available at the three information counters in the store, each serving various subject areas. Information on new releases, bestsellers, children's books, and general titles can be obtained by calling the Front information desk directly at (604) 822-4749. The West information desk provides information on the sciences, engineering, computer science, the humanities, art and architecture. It

can be reached at (604) 822-4744. Information on language and literature, business and professional, and social sciences titles can be obtained by calling the East information desk at (604) 822-4743.

Course Books

Course books and materials are normally available two to three weeks prior to the beginning of classes. Shop early to avoid the line-ups. A first year student can expect to spend between \$300 and \$600 for books and supplies, depending on the program. Both new and used course books are available. Used book buybacks are conducted four times a year, normally at the beginning and end of the winter terms; dates are advertised prior to each buyback period. Course book listings are available in the store, and on View UBC on the Internet (see address above).

General Books and Special Orders

The Bookstore caters to all reading tastes and offers over 85,000 titles in stock. The selection of children's books and fall calendars is one of the largest in Vancouver. There is a free special order service for in-print titles which are not in stock. Special order direct telephone (604) 822-6415. Electronic orders are accepted via e-mail (see Internet address above).

Health Sciences Books and Supplies

The Health Sciences Bookshop carries over 7,000 titles specializing in medical and health sciences, as well as stethoscopes, diagnostic equipment and a variety of medical giftware. Students are encouraged to visit the HSB for a demonstration of medical multimedia products. Information and a catalogue of the latest books can be obtained by calling (604) 875-5588. Orders can be placed toll-free in B.C. at 1-800-665-7119.

Retail Merchandise

The Bookstore offers a wide selection of merchandise including:

- Computers – Apple, IBM, and the UBC Pro (IBM compatible) computers as well as peripherals and a full line of software including educational packages, office programs, CD ROMs and games. Many products are priced at special educational rates which are available to members of the UBC community. Computer repairs, upgrades and maintenance are available in the service shop. Displays of multimedia software and products are ongoing in the Bookstore. Enquiries to the Computer Shop can be made to (604) 822-4748.
- School and Office Supplies – Stationery, school supplies, office products, calculators and electronics. The furniture area offers a wide range of student and office furniture including desks and chairs. Telephone (604) 822-8547.
- Sportswear – UBC clothing, fashion items, bags, packs, aerobic wear and swimwear. Call (604) 822-9825 for a free catalogue of sportswear and gift items.
- Electronics and Entertainment – Fax machines, cellular phones, pagers, calling cards, stereo equipment, computer accessories, audio and video products, and CDs. The Bookstore has everything for the home or office. Telephone (604) 822-6644.
- Art and Design merchandise – one of the largest and best selections of art products in Vancouver, including paints, brushes, specialized art papers and materials, technical pencils and drafting equipment, plus a wide variety of craft supplies. Telephone (604) 822-9849.
- Pens and Gifts – Executive pens, UBC insignia items, greeting cards, social stationery, souvenirs, film, and a large selection of gift and seasonal items. There is also

a special order service for UBC rings and diploma engraving.

Postal Services

The Bookstore is a franchisee for Canada Post and provides the full range of postal services. Direct telephone (604) 822-8196.

The University Library

The University of British Columbia Library is the second largest academic library in Canada and has more than eight million items. There are libraries at eleven locations on campus and three off campus.

Library Orientation

Tours and orientation programs are offered at the beginning of Winter and Summer Sessions. Times are posted. Tours may also be arranged at other times.

The Library publishes numerous guides and handouts explaining the organization of the system and outlining the resources and services available. These may be picked up at information and reference desks throughout the system.

Main Library

Main Library, located on Main Mall, west of the Student Union Building, holds research collections in the humanities, social sciences and physical sciences and offers specialized reference services in these areas. Includes separate divisions for Data Library, Fine Arts, Government Publications and Microforms, Maps, and Special Collections.

Branch Libraries

Sedgewick Library (Main Mall) — Serves undergraduates in Arts and in first and second year Science and Engineering. All campus libraries are open to undergraduates, but Sedgewick is usually the best source of the materials they need.

Asian Library	Asian Centre
Crane Library	Brock Hall (Braille, large print, and tape-recorded materials)
Education Library	Education Building, Main Floor, centre block
Lam Library	David Lam Management Research Centre
Law Library	Law Building
MacMillan Forestry and Agriculture Library	MacMillan Building, Room 360
Mathematics Library	Mathematics Building, Main Floor, south wing
Music Library	Music Building, Fourth Floor
Wilson Recordings Collection	Sedgewick Undergraduate Library
Woodward Biomedical Library	Medical Sciences Complex
Biomedical Branch	Vancouver General Hospital
Hamber Branch	Children's Hospital
St. Paul's Hospital Branch	St. Paul's Hospital

Services

Reference assistance is available in all libraries. Other services such as photocopying and interlibrary loan are also provided. Hours of service are posted in each library.

Extramural Services

Although the Library's collections and services are maintained primarily for UBC students and faculty, they may also be used by persons outside the University whose studies cannot be pursued in other libraries in the province. Those who qualify as extramural borrowers may purchase library cards at the Circulation Division, Main Library.

Archives

Part of the Main Library, the University of British Columbia Archives serves as the central repository for informa-

tion and records created by, for, and about the University. It has the primary responsibility to select, receive, describe, reference, and administer recorded data in all formats produced as part of the official business of the University for all faculties, departments, affiliated agencies, and related bodies. The Archives also collects the papers of selected faculty members and former students and the records of independent student, alumni and employee organizations. In addition to its textual material, the University Archives' holdings also include approximately 200,000 photographic images, 3,500 audio tapes, 750 video tapes and films, and 7,500 maps, plans and drawings.

Women Students' Office

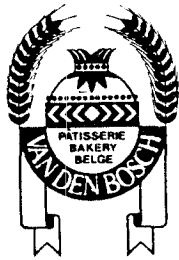
The WSO assists the University (students, faculty, and staff) in creating a welcoming environment for all women students regardless of race, religion, age, disability, ethnic background, or sexual orientation. It is part UBC's commitment to an equitable environment.

The WSO provides feminist counselling and referral services for individual women students, an advocacy service which enables us to identify and address systemic problem areas and issues, and works with faculties/departments to assist them in creating a welcoming environment for women students. Women's safety is a priority for the WSO. Workshops and video/discussions on acquaintance sexual assault prevention are offered each term to interested groups on campus. Counsellors are available to assist women students who are survivors of sexual assault.

Services and Activities

- Individual services — advocacy, information, counselling, support, referrals.
- Support groups — educational, therapeutic and support groups include groups for mature women, and women of colour.
- Workshops — a variety are offered, for example, "Being Heard in Seminars," "Assertiveness in Relationships and in the Classroom" and "Self-Esteem."
- Raise awareness of women's issues — working with other units, the WSO cooperatively offers programs on Acquaintance Sexual Assault Prevention and Education.
- Learning environment — we assist units and faculty in addressing organizational culture and climate for women (chilly climate and inequity in the classroom) by providing resources and/or working with them to accomplish their goals.
- Student opportunities — participation in feminist work include volunteering, practicum placements, and the Peer Education Program (associated with Sexual Assault Prevention Education).
- Out-reach — we offer customized workshops for departments and faculties on request.
- Resource library — features a collection of books, articles, government publications and clippings related to women's issues.

Drop in to Brock Hall, Room 203, 1874 East Mall, between 9:00 am and 4:30 pm, or call (604) 822-2415 for an appointment.



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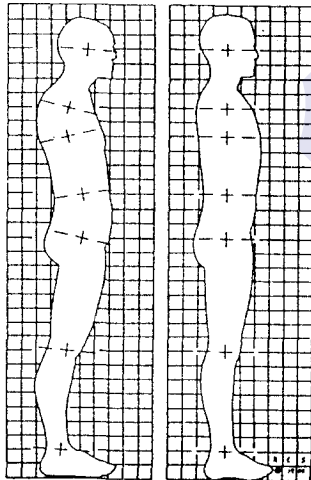
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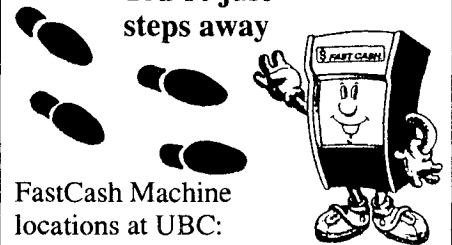
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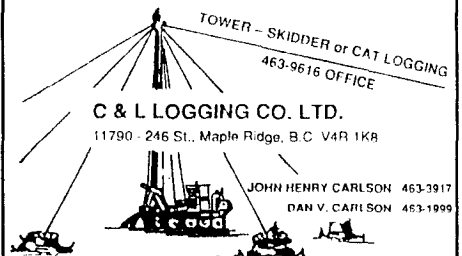
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UBC does not endorse any advertiser in this publication.

Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Alma Mater Society

President: Janice Boyle
 Vice President: Namiko Kunimoto
 Director of Finance: Tara Ivanochiko
 Director of Administration: Am Johal
 Coordinator of External Affairs: David Borns

Every student automatically becomes a member of the Alma Mater Society (A.M.S.) when enrolled in a credit course at the University. The A.M.S. supports all student activities. The A.M.S. is governed by the Students' Council which is composed of a five member Executive, representatives from the faculties and schools, two of the student representatives to the Senate and the two student members of the Board of Governors. The A.M.S. Executive, Senate and Board of Governors representatives are elected by the general student body in January of each year to represent all students at the different levels of Administration and Government.

The offices of the Alma Mater Society are located in the north west corner of the second floor of the Student Union Building; telephone (604) 822-2901.

Student Administrative Commission

The Student Administrative Commission (S.A.C.) is the administrative arm of the A.M.S. S.A.C. is responsible for implementing and enforcing A.M.S. policies regarding the Student Union Building (SUB) and A.M.S.-constituted clubs. It is also responsible for overseeing student elections, SUB Security, the A.M.S. Art Gallery and Clubs Days.

S.A.C. is chaired by the A.M.S. Director of Administration and is comprised of one Secretary and nine Commissioners who are appointed by the Student Council Selections Committee in October and February of each year.

AMS Student University Affairs Office

If you believe that you have been unfairly treated by an authority within the University, the AMS Student University Affairs Office might be able to help. The Office has four main objectives:

- 1) to advise members of the University community on the policies and procedures of the University community;
- 2) to receive and investigate the concerns of UBC students;
- 3) to help UBC students resolve their concerns through communication and mediation; and,
- 4) to refer UBC students to other appropriate organizations for addressing their concerns.

For the purposes of these objectives, "UBC students" may include individuals applying for admission to UBC and recent alumni of UBC.

The AMS Student University Affairs Office is staffed by volunteer students in various academic disciplines. The AMS Student University Affairs Office enjoys the cooperation of the vast majority of academic and administrative authorities while remaining independent of the University administration.

Located on the main concourse of the Student Union Building, the AMS Student University Affairs Office is open year round to deal with the concerns of students and answer any questions students may have. Its hours, however, depend on the time of year. If you are unable to drop in during the posted office hours, please call the Office at (604) 822-4846 in order to arrange a mutually convenient time to meet. You may also wish to write to us at the AMS Student University Affairs Office, The University of British Columbia, Box 60, 6138 S.U.B. Boulevard, Vancouver, B.C., V6T 2A5.

Related Organizations and Agencies

Constituent Societies

Associated with each faculty or school there is a students' society, of which each student in that faculty or school is a member. These societies are responsible for organizing activities and programs in their respective constituencies. The societies are subsidiaries of the Alma Mater Society, and each elects member(s) to the Students' Council.

Student Union Building

The Student Union Building (SUB) was completed in the fall of 1968 and officially opened by Dean W. H. Gage in January 1969. SUB houses the offices of the Alma Mater Society and provides the necessary facilities for most student activities. Originally initiated by students in 1958 and extensively planned by them, SUB was financed jointly by the Alma Mater Society and the University Administration. Total cost of the project was approximately \$5 million, the students' share being approximately 78 percent which was financed by a \$15 per year levy paid by all students. Recently, students financed a \$1.5 million expansion to the Student Union Building. The SUB expansion contains club offices and meeting rooms, a new home for the Intramural Sports program, a restaurant, a snack bar, and a word processing facility.

The original SUB contains rooms of various sizes and uses. These range from a large ballroom to small conference rooms, to seminar rooms, to club areas (photography studios and darkroom, radio station, dive shop, pottery and graphic studios, newspaper). Special facilities include recreation areas (billiards, pub, lounge), commercial areas (delicatessen, bank, college shop, travel service, copy centre, and ticket-centre), cultural areas (art gallery and auditorium), meeting rooms and general open lounge space. These facilities can handle most student-sponsored activities. SUB also contains the largest university-run food service facility on campus.

SUB is managed by the AMS Student Administrative Commission.

The Alma Mater Society publishes twice weekly the student newspaper, *The Ubyssy*. Inside UBC, an orientation publication, student handbook and calendar of events, is published by the A.M.S. and distributed during the first week of lectures in September. Additional publications are *The Discorder*, the CITR - UBC Radio Program Guide, *The Point*, the UBC Intramurals Newspaper, and several constituent society newsletters and journals of interest to members.

University Clubs and Associations

Clubs and associations on campus can become subsidiaries of the Alma Mater Society.

There are currently over 225 clubs and associations on campus and information can be obtained from the A.M.S.

Business Office, located on the second floor of SUB; telephone (604) 822-2901.

New Student Orientation

Orientation is a program of the Alma Mater Society. During the month of August, new students are invited to attend a comprehensive full-day orientation to university life. Information packages will be mailed to all incoming UBC students in early July. For more information, contact the Director of Orientation Services at (604) 822-2901 from April to September.

Alumni Association

Board of Directors

Executive Committee

President: Debra Browning, LL.B. (1980)
 Past President: James M. Stich, B.Sc. (1971), D.M.D. (1975)
 Senior Vice President: Al Poettcker, B.Com. (1970)
 Treasurer: Dickson Wong, B.Com. (1988)
 Executive Director, UBC Alumni Association: Agnes Papke, B.Sc. (Agr.) (1966)

Members-at-Large (1993-95)

Beryl March, B.A. (1942), M.S.A. (1962), D.Sc. (1988)
 Tricia Smith, B.A. (1980), LL.B. (1985)
 Grace Wong, B.Ed. (1974), M.B.A. (1983)

Members-at-Large (1994-96)

Louanne Twaites, B.Sc.(Pharm.) (1953)
 Pamela Friedrich, B.A. (1967)
 Chris Bendl, B.Sc. (1991)

Appointed Members

Administration Representative: Chuck Slonecker, D.D.S., Ph.D.
 Awards Chair: James M. Stich, B.Sc. (1971), D.M.D. (1975)
 Branches Chair: Bob Hindmarch, B.P.E. (1952)
 Convocation/Senate Representative: L. Joanne Stan, B.S.R. (1968), M.Ed. (1981), Ed.D.
 Divisions Committee Chair: Laura Beattie, B.Sc. (Pharm.) (1991)
 Faculty Representative: Clark Binkley, A.B., M.S. (Harv.), Ph.D. (Yale)
 Finance Committee Chair: Dickson Wong, B.Com. (1988)
 Homecoming Chair: Bob Hindmarch, B.P.E. (1952)
 Long Range Planning/Transition Committee Chair: Gerry Podersky Cannon, B.A. (1970), M.A. (1979)
 Marketing Chair: Tricia Smith, B.A. (1980), LL.B. (1985)
 Nominating, Recruitment & Membership Chair: Al Poettcker, B.Com. (1970)
 Past Presidents' Council Representatives: George Plant, B.A.Sc.(1951), John Diggins, B.Sc. (1968), D.M.D. (1972), M.S.D.

Alma Mater Society Representative

President: Bill Dobie

The UBC Alumni Association subscribes to the concept that a university is an institution with which members enjoy a lifelong relationship beginning with their student years.

The role of the Association is to facilitate the relationship of graduates with their university and to support the university in its pursuit of excellence.

Membership is open to all graduates of the University and is automatic upon graduation.

The Association is governed by a Board of Directors elected each year. The Association offices are in Cecil Green Park, 6251 Cecil Green Park Road, Vancouver, B.C., V6T 1Z1; telephone (604) 822-3313.

There are now over 140,000 UBC graduates worldwide. The Association produces and distributes its magazine, the Chronicle, to all graduates with known addresses. An address file is maintained for all alumni. This forms part of the roll of Convocation from which the Chancellor and Convocation members of Senate are elected every three years.

The Association sets criteria for the N.A.M. MacKenzie Scholarships, the Walter H. Gage Bursary Fund, and John B. Macdonald Bursary Fund and a number of individual scholarships. The Association is also one of the trustees of the Walter Gage Memorial Fund which provides aid to individual students and to campus projects.

The Association sponsors a wide range of activities including reunions, student events, programs for graduates of specific faculties and events for alumni living in Canadian and foreign cities.

For further information contact the Executive Director at Cecil Green Park, (604) 822-3313.

Biotechnology Laboratory

Director: Michael Smith

The Biotechnology Laboratory was created specifically to develop fundamental scientific knowledge and technology in the area of biotechnology, and to build an interface between basic and applied sciences in the Faculties of Agricultural Sciences, Applied Science, Forestry, Medicine and Science. The academic appointments of the twelve faculty members in the Biotechnology Laboratory span five faculties and ten departments at UBC. The faculty members in the Biotechnology Laboratory are organized in three principal groups, each with a different focus. The Human/Animal group emphasizes the application of molecular biology to human and animal disease and to neurobiology. The Fermentation/Process Engineering group work on the mass culture of animal cells, sophisticated process biosensors, downstream processing and protein engineering. The Plant/Forest group studies fungal molecular genetics, plant pathogens, the use of DNA probes in tree genetics, and the development of new variants of plants and trees using genetic engineering techniques.

An advanced teaching laboratory has been set up to make available to advanced undergraduate and graduate students a hands-on knowledge of the principles and techniques basic to molecular biology and biotechnology research. In cooperation with academic departments in the university, the teaching laboratory offers courses in molecular biology and fermentation technology to meet the needs of students in various degree programs to obtain training and experience in these areas.

Although there is no Department of Biotechnology at UBC and no formal program leading to a degree in this field, many departments throughout the University offer courses relevant to biotechnology and related areas. A student wishing to specialize in biotechnology at the graduate level will normally be located in a single department and follow a normal degree program by working with a faculty member in the Biotechnology Laboratory. Students requiring additional information should contact the Biotechnology Laboratory at UBC.

The Laboratory has a Steering Committee consisting of the Deans of Science (Chairman), Applied Science, Medicine, Forestry and Agricultural Sciences.

B.C. Research

B.C. Research is an independent industrial research corporation, located at 3650 Westbrook Mall, south of 10th Avenue on the UBC Campus. B.C. Research offers services in the fields of waste management, fisheries and food, forest biotechnology, analytical chemistry, occupational health, specialty products and processes, ocean engineering, engine systems and alternative fuels, integrated engineering services and business development.

The function of B.C. Research is to solve practical industrial problems for clients in both the private and public sectors by performing contract research on a confidential basis. It cooperates with the National Research Council in providing free technical information and industrial engineering services.

B.C. Research has a total staff of 180, of which 110 are professional scientists, engineers, and economists.

B.C. Research maintains close cooperation with the science, engineering and other related departments of the University.

Students undertaking graduate studies may be able to carry out their research in association with B.C. Research. The thesis topics for such students will be in areas of interest common to the university and to B.C. Research and this arrangement is likely to be of most interest to students planning a career in industrial research or development. Normal procedures will apply for acceptance of students and evaluation of the thesis.

Centre for Biodiversity Research

This Centre in the Faculty of Science is concerned with all aspects of biodiversity research. Faculty members from a number of departments in the University are cooperating to investigate the measurement of biological diversity, the role of biodiversity in ecosystem function, factors endangering biodiversity, uses of biological diversity and the many aspects of biodiversity conservation. The West-East Centre for Microbial Diversity is part of the Centre for Biodiversity Research, and there is close association with the Centre for Applied Conservation Biology in the Faculty of Forestry.

Centre for Integrated Computer Systems Research

Director: James M. Varah

The Centre for Integrated Computer Systems Research (CICSR) has been established to facilitate and foster research and graduate training related to computer and information systems. The Centre encompasses research

in computer communications and systems, VLSI design, architecture, and microelectronics; integrated systems design—software engineering; computational intelligence; perception, reasoning and action; robotics, telecontrol and CAD-CAM; algorithms, computational geometry, complexity, graphics, visualization, image processing and user interfaces; numerical computation and applications.

The Centre emphasizes interdisciplinary studies. It actively promotes closer links with the computer and telecommunication industry as well as external organizations interested in the application of computer technology.

The Centre has a Management Committee consisting of the Heads of the Departments of Computer Science, Electrical Engineering, and Mechanical Engineering, and senior researchers representing the research groups.

Fraternities and Sororities

Fraternities and sororities are recognized by the Senate of the University as student organizations. Sororities are governed by the Women's Panhellenic Association. Membership in sororities and fraternities is by invitation.

International House

Honorary Founding Life Members: Thomas H. Flinn, Paul Harris Fellow of Rotary International, Vancouver South Rotary Club, and Herrick B. Young, Executive Director, International House Incorporated, New York. Chairman of the Board of Directors: George Egerton. Executive Director: Winnie L. Cheung. Rotary Club of Vancouver Representative: Bruce Macdougall. Rotary Club of Vancouver South Representative: Harvey White.

International House is a centre for both international and Canadian students as well as visiting scholars and fellows. Besides providing assistance to the international community on campus, International House also aims at promoting cross-cultural interaction and international understanding through its volunteer programs. The facilities, including a resource library, a licensed lounge, a meeting room and open lounges are available to users in support of the mission of International House.

Pulp and Paper Centre

The Centre houses collaborative research and teaching programs between The University of British Columbia and the Pulp and Paper Research Institute of Canada (PAPRICAN). Affiliates of the Centre drawn from University faculty and PAPRICAN staff supervise graduate student research in a variety of engineering fields. The Pulp and Paper Master of Engineering teaching program is also located in the Centre. These academic activities are linked to the industry through PAPRICAN's post-graduate program begun more than sixty years ago at McGill University.

Pulp and Paper Research Institute of Canada (PAPRICAN)

The Pulp and Paper Research Institute of Canada is a non-profit research and educational organization dedicated to enhancing the scientific and technical strength of Canada's pulp and paper industry. The funding of the Institute is borne largely by maintaining member companies which represent nearly all of the pulp and paper producers in Canada. Fundamental and applied research is carried out

in laboratories in Pointe Claire and Montreal, Quebec and in Vancouver, B.C., with a total staff of 360. The Institute also supports programs of post-graduate studies at McGill University and The University of British Columbia, assisting student research for advanced degrees under the supervision of staff members located at these universities. The program at UBC is housed in the Pulp and Paper Centre.

Theological Colleges

Affiliated Colleges

The *University Act*, section 81(1) states that the "... university shall be non-sectarian... in principle," and section 81(2), that "Notwithstanding subsection (1), a theological college incorporated in the Province may be affiliated with a university under a resolution or order made by Senate in that behalf and approved by the board..." An affiliated college has the right to representation of one member on the University Senate.

The granting of affiliation means that the college meets the criteria for affiliation established by the Senate of the University of British Columbia but does not imply any scrutiny or approval of the course offerings of the affiliate by the University Senate.

Vancouver School of Theology

(Anglican, United, Presbyterian, United Methodist)

Principal: Rev. William J. Phillips, B.A., B.D., Th.D.

VST offers varied Master's level programs for general theological study and also provides graduate degrees as preparation for ordained ministry and priesthood in several Christian denominations. As a graduate multid denominational school it seeks to be a centre for theological research and dialogue. It caters to both full and part-time study and, with a focus on educational competence, leads to the following degrees:

- M.P.S. (Master of Pastoral Studies) — a two-year program, for persons wanting a theological basis for specialized ministries in teaching, counselling, pastoral care.
- M.T.S. (Master of Theological Studies) — a two-year program with thesis. Suitable for persons wanting a theological basis for careers in law, or other professions, or a basis for higher theological education.
- M.Div. (Master of Divinity) — a three or four year program leading to professional ministry in the Anglican Church of Canada, the United Church of Canada, the Presbyterian Church in Canada and the United Methodist, Presbyterian, United Church of Christ and Episcopal Churches in the U.S.A.
- Th.M. (Master of Theology) — an advanced degree with thesis.

As part of the Native Ministries Consortium, VST offers a degree program by extension to prepare Native Indian and non-Native persons for professional and lay ministry in the Church.

During the month of July, VST offers two summer school programs. One provides courses at the graduate level for clergy and at the undergraduate level for laity which, with appropriate prerequisites, can be taken for credit. The other offers courses in support of the Native Ministries Degree Program.

The VST Library is available to persons showing a valid UBC Library card.

Vancouver School of Theology was incorporated under this name by the B.C. Legislature in 1971, but continues the former Anglican and United Church Colleges, both of

which were built on this campus in 1927. The Presbyterian Church in Canada was associated with VST in 1984. VST is formally affiliated with the University and is fully accredited by the Association of Theological Schools in the United States and Canada.

Enquiries should be directed to The Registrar, Vancouver School of Theology, 6000 Iona Drive, Vancouver, BC, V6T 1L4; telephone (604) 228-9031, fax (604) 228-0189.

St. Mark's College

(Roman Catholic)

Principal: Rev. T. James Hanrahan, C.S.B., B.A., M.A., L.M.S.

Registrar: Rev. Leo J. Klosterman, C.S.B., B.A., M.S., Ph.D.

St. Mark's College offers certificate programs in theology and religious education, and a limited number of other courses in Theology at several levels. It also provides a theological library open to all members of the University, and facilities for worship and pastoral care.

Regent College

President: Walter C. Wright, Jr., B.A., M.Div., Ph.D.

The College is an autonomous body, trans-denominational in character and evangelical and Biblical in basis. Regent College offers graduate level Biblical and Interdisciplinary courses of instruction for lay men and women that lead to a one-year Diploma in Christian Studies, and a two-year Master of Christian Studies degree. A three-year Master of Divinity degree designed for men and women entering professional ministries is also offered and a fourth post-Master of Divinity year leading to a Master of Theology degree. Summer Sessions consisting of one- and two-week periods as well as a seven-week intensive Hebrew and Greek-Language Session are held each year. The College has formal affiliation with the University, and is a full member of The Association of Theological Schools in the U.S.A. and Canada.

Enquiries should be addressed to The Registrar, Regent College, 5800 University Boulevard, Vancouver, B.C., Canada V6T 2F4.

Residential Colleges

St. Andrew's Hall

(The Presbyterian Church in Canada)

St. Andrew's Hall, in association with Vancouver School of Theology, offers theological education for those preparing for various forms of ministry in the Presbyterian Church in Canada. The Hall provides a dormitory for some 40 men and women, together with chaplaincy services to its theological students and residents. Summer accommodation with self-catering kitchen facilities is available from May 1 until August 31. Ninety-three new self-contained apartments should be ready for occupancy by September 1, 1995, housing single students, couples and families.

Enquiries should be addressed to The Administrator, St. Andrew's Hall, 6040 Iona Drive, Vancouver, B.C. V6T 2E8; telephone (604) 822-9720.

Carey Hall

(Canadian Baptist Federation)

Brian F. Stelck, B.Ed., M.Ed., M.Div., Ph.D., Ordained Minister and Principal.

Roy D. Bell, B.Div., M.Ed., D.Min., D.D., Ordained Minister. Philip Collins, B.Th., B.D., M.Div., D.Min., Ordained Minister, Director, Field Education.

Stanley J. Grenz, B.A., M.Div., D.Theol., Ordained Minister, Pioneer McDonald Professor of Baptist Heritage, Theology and Ethics.

Erb Gullison, Professor of Family Ministries, Registered Psychologist.

John C. Zimmerman, A.B., M.Div., D.Min., Ordained Minister, Professor, Applied Theology, Charles Bentall Professor of Pastoral Studies.

As a residential college, Carey Hall provides residence and dining facilities for 40 co-educational undergraduate students, mostly in single rooms. Carey Hall is also the centre for pastoral studies and graduate internship programs for the Baptist Union of Western Canada offering courses in applied theology, supervised field education, and continuing education programs for church leaders; working in cooperation with Regent College in terms of the M.Div.

UBC Chaplains

University Religious Council

The Council is a President's 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. 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.

Interested students should also see the courses offered in Religious Studies (see the Faculty of Arts section of the *Calendar*). From time to time courses are offered on a non-credit basis by the Centre for Continuing Education. 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 and advisers, whose services are offered on a voluntary basis: Mr. Rob Ogilvie and Mr. Salt Jones, B.A., M.Div., M.A.R.E., (Baptist); Mr. Zac Kaye, M.A., Cert. Ed., Ms. Michelle Gumprich, B.Ed. (Jewish); Rev. Bill Wiegert, B.A., M.Div. (Lutheran); Mr. Peter Dove, B.Th., B.A. (Pentecostal); Sister Marina Smith, B.Ed., M.Ed., M.Th.Ed.; Rev. Doug Hilmer, B.A., B.Ed., M.Div., Rev. Neil Kelly, M.A. (Roman Catholic); Rev. Brad Newcombe, B.S.L., B.Th., S.T.M., Mr. Cal Kemper, B.A., M.S., Ms. Rebecca Kemper, B.A. (United Church); Kathleen Zang, B.A., M.A., M.Div. (Anglican).

The West-East Centre for Microbial Diversity

The University of British Columbia's Department of Microbiology and Immunology and the National University of Singapore's Institute for Molecular and Cellular Biology have entered into a joint venture to pursue research in the area of microbial diversity. Microorganisms play a critical role in the biology of terrestrial and aquatic ecosystems and yet it is estimated that at present we can identify less than 1% of the total number of species. The centre's work will focus on the identification of new organisms and their unique metabolic and physiological characteristics. In addition, the organisms will be evaluated to determine if they have properties of interest to the pharmaceutical

and bioremediation industries. The West-East Centre will bring together the IMCB's excellence in molecular biology with UBC's outstanding groups in biotechnology and microbiology. Together they will work on problems central to developing a better understanding of biodiversity. The research is timely, germane and has the potential to identify organisms which can be exploited by all sectors of the biotechnology industry.

Enrolment 1994/95

(as of November 1, 1994, including Guided Independent Study and Extra-Sessional students)

	M	F	Total
Faculty of Agricultural Sciences			
First Year	53	71	124
Second Year	57	86	143
Third Year	22	50	72
Fourth Year	33	67	100
Away on Exchange	0	1	1
Total	165	275	440

Landscape Architecture

	M	F	Total
First Year	10	7	17
Second Year	12	14	26
Third Year	9	9	18
Fourth Year	~	13	20
Away on Exchange	1	0	1
Total	39	43	82

School of Family and Nutritional Sciences

	M	F	Total
First Year	12	33	45
Second Year	3	71	74
Third Year	3	70	73
Fourth Year	2	54	56
Total	20	228	248
Total in Faculty	224	546	770

Faculty of Applied Science

Engineering

	M	F	Total
First Year	548	95	643
Second Year	408	94	502
Third Year	412	83	495
Fourth Year	491	110	601
Fifth Year	36	~	43
Away on Exchange	1	3	4
Total	1,696	392	2,088

School of Architecture

	M	F	Total
First Year	0	1	1
Second Year	6	4	10
Third Year	23	14	37
Total	29	19	48

School of Nursing

	M	F	Total
First Year	12	136	148
Second Year	6	121	127
Third Year	8	201	209
Fourth Year	~	161	168
Total	33	619	652
Total in Faculty	1,758	1,030	2,788

Faculty of Arts

Arts

	M	F	Total
First Year	548	946	1,494
Second Year	488	1,056	1,544
Third Year	577	1,190	1,767
Fourth Year	697	1,225	1,922
Away on Exchange	11	29	40
Total	2,321	4,446	6,767

Fine Arts

	M	F	Total
Second Year	~	10	17
Third Year	15	35	50
Fourth Year	21	48	69
Total	43	93	136

School of Music

	M	F	Total
First Year	16	26	42
Second Year	19	35	54
Third Year	21	54	75
Fourth Year	37	47	84
Total	93	162	255

School of Social Work

	M	F	Total
Third Year	1	19	20
Fourth Year	5	22	27
Fifth Year	9	60	69
Total	18	101	119

Diploma Programs

	M	F	Total
Applied Creative Non-fiction	3	1	4
Applied Linguistics	4	16	20
Art History	4	21	25
Film Studies	3	6	9
French Translation	4	8	11
Total	17	52	69
Total in Faculty	2,492	4,854	7,346

M F Total

Faculty of Commerce and Business Administration

	M	F	Total
Second Year	156	206	362
Third Year	205	213	418
Fourth Year	229	236	465
Away on Exchange	0	2	2
Total in Faculty	590	657	1,247

Faculty of Dentistry

Dentistry

	M	F	Total
First Year	26	14	40
Second Year	25	16	41
Third Year	25	12	37
Fourth Year	29	11	40
Total	105	53	158

Dental Science

	M	F	Total
Third Year	0	10	10
Fourth Year	0	4	4
Total	0	14	14
Diploma in Periodontics	1	2	3
Dental Residents	5	1	6
Total in Faculty	111	70	181

Faculty of Education

Elementary

	M	F	Total
First Year	90	304	394
Second Year	39	107	146
Third Year	1	19	20
Fourth Year	0	20	20
Fifth Year	0	6	6
Total	136	456	592

Secondary

	M	F	Total
First Year	213	165	378
Second Year	11	4	15
Third Year	0	0	0
Fourth Year	1	0	1
Fifth Year	1	0	1
Total	226	169	395
Diploma in Education	132	606	738

School of Human Kinetics

	M	F	Total
First Year	39	39	78
Second Year	61	40	101
Third Year	113	113	224
Fourth Year	124	119	243
Away on Exchange	0	1	1
Total	337	310	647
Total in Faculty	831	1,541	2,372

Faculty of Forestry

	M	F	Total
First Year	58	45	103
Second Year	103	48	151
Third Year	57	32	89
Fourth Year	59	16	75
Total in Faculty	277	141	418

Faculty of Graduate Studies

Ph.D.

	M	F	Total
Agricultural Sciences	50	26	76
Applied Science	210	39	249
Arts	255	243	498
Combined Ph.D. M.D.	3	3	6
Commerce and Business Administration	54	25	79
Dentistry	~	1	8
Education	89	138	227
Forestry	69	10	79
Graduate Studies	86	71	157
Law	3	4	7
Medicine	96	64	160
Pharmaceutical Sciences	19	8	27
Science	129	147	276
Away on Exchange	0	1	1
Total	1,370	770	2,140
Ed.D.	25	29	54
Pharm.D.	~	5	12
B.M.A.	13	9	22

M.A.

	M	F	Total
Agricultural Sciences	3	15	18
Arts	212	281	493
Community and Regional Planning	42	61	103
Education	129	378	507
Graduate Studies	3	2	5
Science	1	0	1
Total	390	737	1,127

	M	F	Total
M.Sc.			
Agricultural Sciences	94	73	157
Arts	9	9	18
Commerce and Business Administration	31	20	51
Community and Regional Planning	12	4	16
Dentistry	5	7	12
Forestry	55	34	89
Graduate Studies	24	32	56
Medicine	68	127	195
Pharmaceutical Sciences	12	10	22
Rehabilitation Sciences	0	5	5
Science	258	133	391
Total	538	454	992
M.Sc./Dip. Periodontology	1	1	2
M.F.A.	27	52	79
M.H.A.	8	13	21
M.H.Sc.	15	15	30
M.Mus.	18	22	40
M.A.Sc.	285	70	355
M.A.S.A.	6	9	15
M.Arch.	63	34	97
M.Eng.	99	22	121
M.S.N.	3	139	142
M.B.A.	216	119	335
M.B.A./LL.B.	5	5	10
M.F.	16	1	17
M.Ed.	148	332	480
M.H.K.	17	4	21
LL.M.	29	19	48
M.S.W.	22	62	84
M.A.S.	28	32	60
M.L.A.	1	1	2
M.L.S.	21	88	109
Total in Faculty	3,371	3,044	6,415
Faculty of Law			
First Year	101	91	192
Second Year	95	87	182
Third Year	103	107	210
Away on Exchange	7	4	11
Total in Faculty	306	289	595
Faculty of Medicine			
First Year	65	57	120
Second Year	56	65	121
Third Year	62	53	115
Fourth Year	69	51	120
Total	250	226	476
Medical Residents	363	180	543
Medical Laboratory Science			
Third Year	16	44	60
Fourth Year	9	17	26
Total	25	61	86
School of Rehabilitation Sciences			
Second Year	17	53	70
Third Year	18	53	71
Fourth Year	16	54	70
Total	51	160	211
Total in Faculty	689	627	1,316
Faculty of Pharmaceutical Sciences			
First Year	60	80	140
Second Year	41	84	125
Third Year	50	74	124
Fourth Year	52	55	107
Total	203	293	496
Pharmacy Residents	5	12	17
Total in Faculty	208	305	513
Faculty of Science			
First Year	503	658	1,141
Second Year	628	602	1,230
Third Year	577	470	1,047
Fourth Year	710	497	1,207
Away on Exchange	2	1	3
Total	2,420	2,208	4,628
Diploma in Meteorology	5	0	5
Total in Faculty	2,425	2,208	4,633
Qualifying Year	5	9	14
Unclassified	752	1,153	1,905
Visiting	184	247	431
Concurrent Studies	1	0	1
Auditors	1	0	1
Exchange	91	83	174
Total	1,034	1,492	2,526
Total Winter Session	14,314	16,804	31,118
Summer Session 1994	6,522	8,488	15,010
Grand Total 1994/95	20,836	25,292	46,128

Degrees Conferred 1994

Spring

Ph.D.—144; Pharm.D.—6; Ed.D.—9; M.A.S.A.—1; M.A.Sc.—78; M.A.—121; M.A.(Planning)—16; M.A.S.—6; M.B.A.—135; M.Sc.(Bus. Admin.)—9; M.Ed.—50; M.Eng.—16; M.F.A.—13; M.F.—1; M.H.A.—5; M.H.K.—5; M.H.Sc.—2; LL.M.—8; M.L.S.—30; M.Mus.—8; M.Sc.—113; M.Sc.(Planning)—7; M.S.N.—11; M.S.W.—5; B.A.Sc.—357; B.Arch.—34; B.A.—1249; B.Com.—445; B.D.Sc.—3; D.M.D.—38; B.Ed.—173; B.F.A.—17; B.H.E.—19; B.H.K.—160; LL.B.—209; M.D.—112; B.M.L.Sc.—15; B.Mus.—48; B.S.N.—146; B.Sc.—759; B.Sc.(Agr.)—43; B.L.A.—13; B.Sc.(Dietet.)—25; B.S.F.—49; B.Sc.(Forestry)—11; B.Sc.(Pharm.)—99; B.Sc.(O.T.)—32; B.Sc.(P.T.)—34; B.S.W.—52; **Total—4,941.**

Fall

Ph.D.—110; Ed.D.—3; D.M.A.—4; M.A.Sc.—41; M.Arch.—3; M.A.—137; M.A.(Planning)—17; M.A.S.—9; M.B.A.—17; M.Sc.(Bus.Admin.)—7; M.Ed.—78; M.Eng.—17; M.F.A.—15; M.F.—2; M.H.A.—11; M.H.K.—2; M.H.Sc.—11; M.L.A.—1; LL.M.—9; M.L.S.—8; M.Mus.—3; M.Sc.—98; M.Sc.(Planning)—3; M.S.N.—11; M.S.W.—31; B.A.Sc.—30; B.Arch.—5; B.A.—299; B.Com.—18; B.Ed.—562; B.F.A.—9; B.H.E.—1; B.H.K.—17; LL.B.—11; B.M.L.Sc.—2; B.Mus.—11; B.S.N.—14; B.Sc.—92; B.Sc.(Agr.)—1; B.L.A.—1; B.Sc.(Dietet.)—3; B.S.F.—23; B.Sc.(Forestry)—4; B.Sc.(Pharm.)—4; B.Sc.(O.T.)—2; B.S.W.—5; **Total—1,762.**

Diplomas Granted 1994

	Spring	Fall
Applied Creative Non-Fiction	1	1
Applied Linguistics	5	1
Art History	5	2
Education	133	202
Film Studies	0	3
French Translation	1	3
Meteorology	-	0
Periodontology	0	4
Total	152	216

Health Sciences

The John F. McCreary Health Sciences Centre of The University of British Columbia provides a common learning environment for students of the Health Sciences and Professions.

Located in the Health Sciences Centre are buildings that house the basic medical sciences; the Faculty of Dentistry; the Faculty of Pharmaceutical Sciences, the Schools of Nursing, Rehabilitation Sciences, and Audiology and Speech Sciences; and three units (Acute Care, Psychiatry and Extended Care) that constitute University Hospital-UBC Site. The Campus Family Practice Unit, the Biomedical Research Centre, and a biomedical library are also part of the Health Sciences Centre. The Instructional Resources Centre includes administrative and researcher's offices and teaching facilities for the Health Sciences faculties and schools.

The Health Sciences Co-ordinating Committee, comprised of the deans and directors of the Health Sciences faculties and schools, participates in the planning of the physical and administrative structures of the Health Sciences. The Office of the Co-ordinator of Health Sciences is administratively responsible for shared facilities in the Instructional Resources Centre. The Office includes three divisions that provide common services for the Health Sciences faculties and schools and the Centre for Health Services and Policy Research which facilitates and undertakes research in a broad range of areas, and sponsors public fora to disseminate research results in these areas.

Office of the Co-ordinator of Health Sciences

Co-ordinator of Health Sciences: William A. Webber, M.D., FRCPC, Associate Vice-President, Academic, and Professor, Department of Anatomy, Faculty of Medicine. The Co-ordinator of Health Sciences chairs the Health Sciences Co-ordinating Committee and a decanal committee with administrative responsibility for the Centre for Health Services and Policy Research. The Co-ordinator also represents the Health Sciences on appropriate University committees, and the University on committees of external agencies involved in health care, teaching and research.

Division of Health Care Ethics

Director: Vincent P. Sweeney, M.B., Ch.B., F.A.C.P., FRCPC, Professor (Medicine).

The Division of Health Care Ethics operates within the Office of the Co-ordinator of Health Sciences in order to develop and support programs in bioethics within the Health Sciences disciplines. Interdisciplinary programs for the various faculties and schools have been developed as part of the mission of the division. The Division is involved in the promotion of health care programs throughout the Province and biomedical education research nationally and internationally.

Division of Continuing Education in the Health Sciences

Director, Continuing Dental Education: Jane M. Wong, Dip.D.H., B.A., Program Director, Dean's Office, Faculty of Dentistry.

Director, Continuing Medical Education: David S. Lirenman, B.Sc., M.D., FRCPC, F.A.C.P., Professor (Paediatrics) and Associate Dean, Faculty of Medicine.

Coordinator, Continuing Education in Nutrition and Dietetics: Jan K. Greenwood, B.Sc., R.D.N., C.N.S.D.

Director, Continuing Pharmacy Education:

Sharon McKinnon, B.Sc. (Pharm.), Lecturer (Pharmacy Administration), Faculty of Pharmaceutical Sciences.

This Division co-ordinates the individual professional continuing education programs of a number of Health Sciences faculties and schools, and also provides a base for interprofessional programs.

Division of Educational Support and Development

Director: Gordon G. Page, M.A., Ed. D., Associate Professor (Medicine).

Associate Director: Marc Broudo, M.A.

This division was established in 1975 to provide consultation and service to the Health Sciences faculties and schools on issues such as educational program development and evaluation, the evaluation of students, instructional materials development, and teaching and course evaluation. The division is involved in provincial, national and international research and development programs on the evaluation of the clinical competence of students and practising health professionals, and on the improvement of educational programs and the effectiveness of teaching in the Health Sciences.

Centre for Health Services and Policy Research

Director: Morris L. Barer, M.B.A., Ph.D., Professor (Health Care and Epidemiology).

Associate Director: Clyde Hertzman, M.D., M.Sc., FRCPC, Associate Professor (Health Care and Epidemiology).

Associate Director: Arminée Kazanjian, M.A., Dr. Soc., Assistant Professor (Health Care and Epidemiology).

The Centre was established in 1990 to promote and conduct multidisciplinary research and to develop and maintain databases necessary to these areas of research. Research is carried out in areas of population health, health services research and program evaluation, health technology assessment, health policy development and analysis, and health human resources research.

The research program at the Centre involves clinical epidemiologists, health economists, medical sociologists, operations researchers, health policy analysts, medical anthropologists, social workers, and other faculty at UBC. Faculty are involved in collaborative projects with researchers at other institutions in Canada, the United States and elsewhere.

The B.C. Office of Health Technology Assessment, the Health Human Resources Unit, the Health Policy Research Unit, and the Health Information Development Unit are situated at the Centre. Advice and assistance on issues falling within the Centre's mandate and expertise are provided to both governmental and non-governmental agencies. The Centre communicates results of faculty and staff research activities by sponsoring public seminars, workshops and conferences and circulating discussion papers, research reports and reprints.


While the Centre does not offer courses, it provides a variety of research resources for student projects and theses, and a potential site for summer work and research clerkships.

Courses of Instruction

The following faculties and schools offer courses in Health Sciences: Dentistry, Family and Nutritional Sciences, Medicine, Nursing, Pharmaceutical Sciences, Rehabilitation Sciences, and Social Work, as well as the Department of Psychology (in the Faculty of Arts). For more information, see the Faculty/School listings in the Index.

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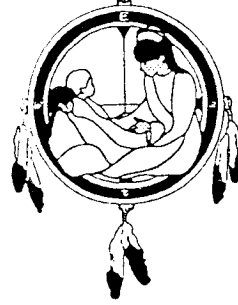
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For further information please contact:

**The coordinator, NNAPN
College of Nursing
University of Saskatchewan
Saskatoon, SK S7N 5E5**

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1-800-463-3345, or 966-6224

Notes

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1995-96

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1995-96

Bachelor of Science in Agriculture Degree

The Faculty offers a four-year program 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 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.

Study programs in the Faculty of Agricultural Sciences are offered in the following departments:

- Agricultural Economics
- Bio-Resource Engineering (through the Faculty of Applied Science)
- Animal Science
- Food Science
- Plant Science
- Soil Science

Note: There is sufficient flexibility in the programs of the above departments to accommodate individual student interests. Students with a special interest are advised to consult the Associate Dean who will refer them to appropriate departments. With advice of the Head of the appropriate department, students can select a program of courses that emphasize biotechnology.

Bachelor of Landscape Architecture Degree

In the Bachelor of Landscape Architecture program, the Faculty offers a four-year program of study designed to prepare graduates for entrance into the profession. The B.L.A. program consists of a core of required courses and a wide range of elective courses. The program emphasizes design, and covers the range of landscape contexts from the urban setting to regional and natural resource situations.

Master of Science Degree and Doctor of Philosophy Degree

See the Faculty of Graduate Studies section of the *Calendar*.

Master of Landscape Architecture Degree

See the Faculty of Graduate Studies section of the *Calendar*.

Veterinary Medicine

The Western College of Veterinary Medicine (W.C.V.M.) was established at the University of Saskatchewan to serve the four western provinces. A pre-veterinary program is required in preparation for admission to the four-year veterinary program at the W.C.V.M., and may be completed at UBC in the Faculty of Agricultural Sciences.

The course requirements for admission to W.C.V.M. are: six credits each of English, Biology, Biochemistry, Chemistry, Physics and Mathematics; three credits each of Genetics, Organic Chemistry and Introductory Microbiology; and additional electives to complete 60 credits.

Competition for admission to W.C.V.M. is severe, and although pre-veterinary requirements can be met in two years, few applicants are currently admitted with less than three years of university coursework. Pre-veterinary students are therefore strongly advised to follow a program that also satisfies the requirements of the B.Sc.(Agr.)

The Faculty of Agricultural Sciences

The Faculty of Agricultural Sciences offers courses leading to:

- Bachelor of Home Economics (B.H.E.)
- Bachelor of Science in Agriculture B.Sc. (Agr.)
- Bachelor of Science in Dietetics (B.Sc. (Dietet.))
- Bachelor of Landscape Architecture B.L.A.
- Master of Science (M.Sc.), Faculty of Graduate Studies.
- Master of Landscape Architecture (M.L.A.), Faculty of Graduate Studies.
- Doctor of Philosophy (Ph.D.), Faculty of Graduate Studies.

The Faculty of Agricultural Sciences offers a wide selection of courses emphasizing the basic and agricultural sciences in agriculturally-related disciplines, with the object of developing an understanding of the appropriate applications of scientific and design principles in students whose aptitudes and interests lie in the natural and social sciences and whose career objectives are directed towards scientific research, business and industry, teaching, or public and private service. The Faculty's School of Family and Nutritional Sciences offers four undergraduate programs, which are described elsewhere in the *Calendar*.

program. For information and program approval, contact the office of the Dean, Faculty of Agricultural Sciences.

The following selection of courses meets the requirements of the Western College of Veterinary Medicine at the University of Saskatchewan and also those for the first two years of the program for the B.Sc. (Agr.) degree at The University of British Columbia.

Pre-Veterinary students entering the Faculty for the first time in First Year

First Year		Credits
Course		
AGSC 100		0
AGSC 200 or 210		3
BIOL 110 or 115 ¹		3 or 0
BIOL 120		3
CHEM 105 or 110 or 121-122		6
ECON 100 ²		0 or 6
ENGL 100-level ³		3 or 0
MATH 100, 120 or 140		3
MATH 101, 121 or 141		3
PHYS 100, 101 or 01, 102 or 120/121		6
Total		30

Second Year		Credits
Course		
AGSC 215		3
AGSC 325 ⁴		3
ANS 258		3
BIOL 200		3
BIOL 201		3
CHEM 230		0
ECON 300		6 or 0
ENGL 100-level ³		0 or 3

MICB 201	3
MICB 202	3
Total	33 or 30

Note: All pre-veterinary students are required to consult with their advisers before the end of the first week of classes.

¹ BIOL 110 is available only to students who have not received credit for Biology 12. Students who have received a grade of at least 80% in Biology 12 will not be required to take either BIOL 110 or 115.

² Students not taking either BIOL 110 or 115 should complete ECON 100 in first year, and should defer ENGL 100-level to second year.

³ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121.

⁴ AGSC 325 counts as three credits towards the English requirements necessary for the Pre-veterinary Program.

Part-time Students

Students wishing to take less than a full course load should consult the appropriate Department Head or the Dean's Office before registering. Some evening classes are available.

Continuing Education

Specialized non-credit courses in various areas of agriculture are offered periodically. Announcements giving details of the various courses are issued each year, and may be obtained from the Office of the Dean, Faculty of Agricultural Sciences.

Professional Associations

Agrology—Agrology is the profession of applying science and scientific principles to the business and art of agricul-

ture. In British Columbia, agronomy is recognized by the provincial statute of 1948, the Agrologists Act, under which the British Columbia Institute of Agrologists (B.C.I.A.) is incorporated.

A graduate of the Faculty holding the B.Sc. (Agr.) degree meets the educational requirements for membership in the B.C. Institute of Agrologists.

A graduate who plans to practise as an agrologist in the province of British Columbia is expected to register as a member of the B.C.I.A. Applications should be forwarded to the Registrar, B.C.I.A.

Landscape Architecture—In order to practise as a Professional Landscape Architect in the Province of British Columbia, it is necessary to be registered as a member in the British Columbia Society of Landscape Architects as laid down in the B.C. Landscape Architects Act. A student who plans to become a landscape architect may enrol with the Society. Applications should be forwarded to the Registrar, B.C. Society of Landscape Architects.

Arrangements exist for students in the Faculty to regularly receive the communications and periodicals of the profession upon payment of a nominal fee. For further information contact the Landscape Architecture office.

Study Programs at Other Canadian Universities

The program of study leading to the B.Sc. (Agr.) is similar to programs offered by faculties of agriculture at universities in other provinces in Canada. Students may wish to consider taking a portion of their program at one of these other faculties for subsequent transfer to the University of British Columbia. Interested students should consult the Dean's office for further information.

Bachelor of Science in Agriculture B.Sc. (Agr.)

Admission

Students should refer to the General Information section on Admission. Students may gain admission directly from secondary school or on transfer from a recognized university or college, or on the basis of maturity and experience. Students seeking transfer from other universities or colleges will be granted advance credit for parallel courses in the first two years of the degree program where standings obtained are above the minimum passing grade at the other institutions.

For admission to the B.Sc. (Agr.) program, students from Grade 12 British Columbia schools must meet the general University admission requirements and must have completed English 11 and 12; Social Studies 11; French 11 or another approved language 11; Mathematics 11 and 12; at least two of Biology 11, Chemistry 11 and Physics 11; a science course numbered "12" chosen from Chemistry 12, Physics 12, Geometry 12, Biology 12, Geology 12; a course numbered "12" chosen from among those listed in the prescribed Senior Secondary School Curriculum in the category 'Arts or Science.'

English Requirement

To qualify for the B.Sc. (Agr.) degree, students must complete at least three credits of first-year English. Although English 112 is highly recommended, qualified students are encouraged to consider English 120 and/or 121.

Note: Satisfactory Completion of the Language Proficiency Index (LPI) examination is prerequisite to all first-

year English courses at UBC. (See *Calendar* index under "Language Proficiency Index.") Students who have not achieved an LPI score of 5 or 6 by the time they have completed 30 credits will normally be required to withdraw from the Faculty of Agricultural Sciences.

Students who have not completed at least three credits of first-year English will not normally be permitted to enrol in third-year or higher-level courses in the Faculty.

Science One

Successful completion of the Science One program fulfills all of the Science and Mathematics requirements of first year.

Four-Year Course Curriculum

Candidates for the B.Sc.(Agr.) degree must complete at least 125 credits as required in one of the Program Specializations presented below. In selecting courses for each year, the student is advised to consult a Faculty, Departmental or Program Specialization Adviser. Normally, no more than 38 credits of study may be taken by a student in any one year. No more than nine credits of electives outside the Program Specialization may be taken in either first or second year, without the permission of the Dean of Agricultural Sciences.

On graduation, honours standing will be granted to those students who have averaged "A-" or higher in the best 62 credits of courses, which are selected by the Department or Program Specialization, and which meet the requirements.

Dean's Honour List

Students with a standing of "A-" or better in the previous winter session will receive the notation "Dean's Honour List" on their records. A program of at least 30 approved credits must have been completed during the session to receive this designation.

Requirements for the B.Sc. (Agr.) Degree

Courses must be approved by a Program Adviser, and should be chosen to meet the requirements of one of the Program Specializations listed below. All Program specializations offer an opportunity for qualified students to prepare a thesis in the graduating year. Some programs require students to complete either the thesis or a comprehensive essay in the graduating year. The thesis or essay title must be approved by the Program Adviser. Two copies of the report must be filed by April 1 for Spring graduation or September 15 for Fall graduation.

Students are advised to select their Program Specialization no later than the beginning of second year. Students who enter the Faculty for the first time at the second or third year level must register for courses required in the first and second years. Students entering in first year who have not selected a Program Specialization should carefully review each Specialization, and should register for 30 credits that may apply to one or more Program Specializations. Such courses commonly include AGSC 100, 200, 210, BIOL 110 or 115, 120, CHEM 103 or 110 or 121/122, ENGL 100-level, ECON 100, MATH 100/101 or 120/121 or 140/141 and PHYS 100, 101/102 or 121/122.

Note: All students in the B.Sc.(Agr.) program must complete AGSC 300, a one-week field trip, normally taken during the summer before third year.

Attendance, Examination and Advancement

1) Regular attendance is expected of students in all their classes. Students who neglect their academic work and assignments may be excluded from the final examination. Students who are unavoidably absent

because of illness or disability should report to their instructors on return to lecture or laboratory class.

- 2) Students who are absent from December or April examinations because of illness must submit a certificate obtained from a physician to the University Health Service as soon as possible. If injury or illness did not cause the absence, an explanation of the circumstances should be written to the Dean.

Applications for special consideration on account of illness or domestic affliction must be submitted in writing to the Dean as soon as possible after the close of the examination period.

- 3) Formal written examinations are required at the end of all courses terminating in December or April and also in December for courses continuing all year. The formal written examination may be replaced by alternative examination procedures only upon approval of the Head of Department and with permission of the Dean. Passing of the final examination may not be sufficient to pass a particular course but in some courses it may be a requirement. Students may be denied a passing grade for unsatisfactory work during the session or if their essays, reports or examinations are notably deficient in English. Also, in any course which involves both laboratory work and written examinations, students must complete and pass both parts to pass the course.

Any student whose academic record, as determined by tests and examinations of the first term, is unsatisfactory may be required to withdraw from the Faculty at any time.

A passing grade is 50-64%; second class is 65-79%; first class is 80-100%.

- 4) Students will be classified or promoted according to the following criteria:

to Second Year Level: Successful completion of 21 or more credits of prescribed courses of first year.

to Third Year Level: Successful completion of 54 or more credits including, including at least three credits of first-year English and all the required courses of first year. Students who do not meet this requirement will not normally be permitted to enrol in third year or higher level courses in the Faculty.

to Fourth Year Level: Successful completion of a total of 89 or more credits.

- 5) Fail standing will be assigned in a session when a student
 - a) has taken a study program of more than 12 credits and passed in less than 60% of it; or
 - b) has taken a study program of 12 or fewer credits and passed in less than 50% of it.

A student who fails a year will normally be required to withdraw from the University for a period of at least one year after which time an appeal for permission to re-enrol will be considered. Before applying for permission to re-enrol, a first or second year student who fails a year is advised to complete satisfactorily ("C" average or better) those courses outstanding from the failed year at a community college. A student who fails a year but passes in some courses will receive credit for the courses passed upon reinstatement in the Faculty.

- 6) Probationary status will be assigned to a student
 - a) who is readmitted to the Faculty after having been required to withdraw or
 - b) who passes the Winter Session, but fails in more than six credits of work or fails to achieve an overall average of 55% on all courses attempted.

At the end of a probationary year, the student may be reinstated; if there has been insufficient improvement the student will not be permitted to proceed to the next year level.

- 7) In the Winter Session, the total of all courses taken may not exceed 38 credits except with approval of the Dean.
- 8) Students in the Faculty of Agricultural Sciences who wish to take courses at other institutions for transfer of credit toward the B.Sc. (Agr.) or the B.L.A. degrees must obtain permission in advance from the Dean.
- 9) A student who decides to withdraw from the University should refer to the General Information section of the *Calendar*. (See Index under "Withdrawal".)

Teacher Education Course

As well as satisfying the requirements of their own departments in the Faculty, students planning to enter the Faculty of Education to qualify as Secondary Teachers of Agricultural Sciences, must have BIOL 110 or 115 and BIOL 120, CHEM 103 or 110 or 121/122, MATH 100 and 101, ECON 100, PHYS 100/101 or 101/102 or 120/121, and in addition must have at least 18 credits in approved courses selected from one of the following: Biological Sciences, Chemistry, Geological Sciences, Mathematics, Physics or other Academic Concentration agreeable to the Faculty of Education. The particular courses should be selected according to the requirements of the Faculty of Education (Secondary Teaching Field Requirements). Three to six credits of Geology or Geophysics are strongly recommended

For further particulars see Faculty of Education section.

Undergraduate Study Programs

Students seeking the degree of B.Sc. (Agr.) must complete the requirements of one of the study programs listed below. The study program must be selected before entering the third year, but it is to a student's advantage to make the choice of program before beginning Second Year.

Rangeland Resources

Students planning to complete study programs in the Departments of Animal Science or Plant Science may focus their studies on Rangeland Resources by completing a common core of 33 credits and an additional 33 credits chosen to meet the requirements of one of the departments. Common core courses: AGECE 258 (3), ANSC 258 (3), BIOL 302 (3), ECON 370 (3), PHYS 100/101 or 101/102 or 121/122 (6), PLNT 259 (3), 304 (3), 401 (3), 404 (3), SOIL 200 (3). The additional 33 credits are itemized in the departmental programs which follow. Interested students should consult the appropriate Head or the Dean prior to the beginning of second year for details.

Descriptions of individual courses appear alphabetically by department or faculty in the section, Courses of Instruction.

Agricultural Economics

Agricultural Economics involves the application of economic theory to real world problems and issues, particularly in the agriculture and natural resource sectors. Topics covered include farm and business management, marketing, policy, role of agriculture in developing countries and international trade. Attention is given to concerns related to the environment, including soil erosion, wildlife habitat, and food safety.

The training in this program is broad enough to qualify students for a wide range of work, both in Canada and abroad.

The program in Agricultural Economics is flexible and allows students to access course offerings that meet their interests within the University at large.

Requirements for the B.Sc. (Agr.) Degree

First Year

Course	Credits
AGSC 100	0
AGSC 200 or 210	3
BIOL 110 or 115 or 120 ¹	3
CHEM 105 or 110 or 121/122 ²	6
ECON 100	6
ENGL 100-level ³	6
MATH 100 or 120 or 140	3
MATH 101 or 121 or 141	3
Total	30

Second Year

Course	Credits
AGSC 200 or 210	3
AGSC 220	3
Agricultural Sciences Electives ⁴	9
AGECE 201	3
AGECE 258	3
AGECE 260 ⁵	3
ECON 201	3
ECON 202	3
Unrestricted elective	3
Total	33

Third Year

Course	Credits
AGSC 300	2
Agricultural Economics Core ⁶	9
ECON 303 or AGECE 295 ⁷	3
ECON 325	3
ECON 326	3
Organizational Behavior/Cultural Diversity ⁸	3
AGSC 323	3
AGSC 320	3
Program Electives ⁹	3
Total	32

Fourth Year

Course	Credits
AGECE 498 or 499 ¹⁰	3 or 6
Agricultural Economics Core ⁶	9 or 6
Program Electives ⁹	9
Unrestricted Electives	9
Total	30
Program Total	125

¹ BIOL 110 is open only to students who have not received credit for Biology 12.

² A first-year Physics course must precede or be taken concurrently with CHEM 110. MATH 100 or 120 must precede or be taken concurrently with CHEM 121.

³ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121.

⁴ Choose nine credits from courses offered by the Faculty of Agricultural Sciences, excluding AGECE courses. Agricultural Sciences electives must be approved by a Program Adviser.

⁵ Econ 320 can substitute for AGECE 260 in special circumstances with approval from the Head of the Department.

⁶ Core courses include AGECE 302, 306, 340, 361, 374, 400, 407 and 420. Students selecting AGECE 499 must choose a minimum of 15 credits from this list; those taking AGECE 498 require 18 credits. Note that AGECE 302 and AGECE 400 are offered in alternate years. AGECE 407 and AGECE 420 are best taken in fourth year. Extra credits from Agricultural Economics core courses can be used towards Program Electives.

⁷ ECON 303 is a prerequisite for some 400-level ECON courses, and should be taken by any student considering going on for an M.Sc. AGECE 295 is recommended for students specializing in agribusiness. If both are taken, one may be used for credit towards Program Electives.

⁸ COMM 329 or a culturally-enriching course selected in consultation with a Departmental or Program Specialization Adviser.

⁹ Students may choose from 300- or 400-level courses in Agricultural Economics, other programs in the Faculty of Agricultural Sciences, the School of Family and Nutritional Sciences (maximum three credits), the Department of Economics, and the Faculty of Commerce and Business Administration. COMM 297 is also eligible. In designing your program, note that 300-level Economics courses (except courses in theory, statistics and economic history) are only offered every other year.

¹⁰ Most students should plan to do the Undergraduate Essay (AGECE 498) rather than the Undergraduate Thesis (AGECE 499). The Thesis option is available only to students who have defined a research problem, have access to relevant data, and have completed ECON 325 and 326. To qualify for the Thesis option, students must obtain written approval from an Agricultural Economics faculty member willing to supervise their thesis. This letter must be in the student's file by June 30 preceding their fourth year.

Courses offered by other Faculties

Apart from courses in other faculties listed as requirements for the options in Agricultural Economics, there are many others which could be chosen as electives.

The following departments and faculties offer courses directly complementary to programs of study in Agricultural Economics: Anthropology, Commerce, Computer Science, Economics, Education, Forestry, Geography, Mathematics, Political Science, Psychology and Sociology.

Agro-Ecology

This program is a specialization within the B.Sc.(Agr.) focusing on issues of the management of agro-ecosystems including environmental stewardship and the sustainability of food production and agricultural practices. Integrating successful agricultural enterprises with other rural land uses while maintaining environmental values and urban activities, requires professional agriculturists who are accustomed to interdisciplinary study and work. Students in this program will acquire a basic understanding of the interconnectedness of the cultural, biological, hydrological and soil systems upon which agricultural systems depend.

Equal emphasis will be placed on holistic problem identification, risk assessment and on the development of problem solving skills. In addition to interdisciplinary learning opportunities, students in this program will have the choice of concentrating a major portion of their program in one of three foci: Land and Water Resources, Sustainable Agricultural Systems and Socioeconomics.

Requirements for the B.Sc. (Agr.) Degree

First Year

Course	Credits
AGSC 100	0
AGSC 200 or 210	3
BIOL 110 or 115 ¹	3 or 0
BIOL 120	3
CHEM 105 or 110 or 120/121	6
ECON 100	6
Electives ⁴	0 or 3
ENGL 100-level ³	3
MATH 100, 120 or 140	3
MATH 101, 121 or 141	3
Total	30

Second Year

Course	Credits
AGECE 258 or PLNT 259	3
AGSC 210 or 200	3
AGSC 220	3
ANSC 258	3
GEOG 103	3
PHYS 101 or 121	3
SOIL 200	3
Agricultural Sciences Electives ⁴	12
Total	33

Third and Fourth Years

Course	Credits
AGEC 258 or PLNT 259	3
AGEC 374	3
AGSC 300	2
AGSC 310	3
AGSC 320	3
AGSC 323	3
AGSC 410	3
BIOL 303 or FRST 202	3
COMM 329	3
PLNT 321 ¹	3
Program Electives ⁵	24
Unrestricted Electives	9
Total	62
Program Total	125

¹ BIOL 110 is open only to students who have not received credit for Biology 12. Students who have received a grade of at least 80% in Biology 12 will not be required to take either BIOL 110 or 115. An appropriate substitution for BIOL 110 or 115 must be approved by a Program Adviser.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121.

³ Agricultural Sciences electives must be approved by a Program Adviser, and will normally be selected to emphasize Land and Water Resources, Sustainable Agricultural Systems or Socio-Economics.

Land and Water Resources: CHEM 230, GEOL 100, SOIL 204

Sustainable Agriculture: AGECE 201, AGSC 213, CHEM 230

Socioeconomics: AGECE 201, AGECE 260, ECON 201, SOCI 100

⁴ FRST 231 or BIOL 300 may be substituted for PLNT 321, if approved by a Program Adviser. ECON 325 is recommended for students in the Socioeconomic option.

⁵ Program electives must be approved by a Program Specialization Adviser, and should be selected from the following lists. Qualified students will also be given an opportunity to complete a thesis or essay in their graduating year. The program must include at least 48 credits at the third or fourth-year level.

Land and Water Resources: BIOE 360, BIOE 361, CHEM 205 or 201/202, CHEM 301, FRST 387, FRST 420, FRST 485, GEOL 312, GEOL 342, GEOL 442, MATH 200, MATH 221, SOIL 313, SOIL 314, SOIL 403, SOIL 415, SOIL 416, SOIL 417, SOIL 433, SOIL 435, SOIL 442

Sustainable Agriculture: AGECE 201, AGECE 295, AGECE 340, AGECE 361, AGECE 403, AGECE 420, ANSC 313, ANSC 321, ANSC 322, ANSC 417, ANSC 450, ANSC 460, ANSC 480, BIOE 258, BIOE 360, BIOE 390, FOOD 258, HUNI 203, HUNI 205, HUNI 303, PLNT 304, PLNT 324, PLNT 331, PLNT 336, PLNT 338, PLNT 401, PLNT 408, PLNT 411, PLNT 417, PLNT 431, PLNT 433, SOCI 100, SOCI 204, SOIL 321, SOIL 415, SOIL 416, SOIL 433

Socioeconomics: AGECE 302, AGECE 306, AGECE 340, AGECE 361, AGECE 403, AGECE 420, COMM 489, ECON 202, ECON 326, ECON 370, ECON 371, ECON 471, ECON 472, LAW 356, SOCI 301, SOCI 360, SOCI 420

Animal Science

The Department has teaching and research facilities for study in nutrition, physiology, genetics, production management, behaviour, wildlife management and aquacultural science. Laboratories are located in the main Agricultural Sciences building (H. R. MacMillan Building) and the National Centres of Excellence Building. Ancillary facilities are available for teaching and research involving avian species (layer, broiler, breeder, quail and pigeon), beef cattle, dairy cattle, fish, sheep, swine and wildlife. Field research areas are available also for studies of livestock and wildlife productivity.

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 requirements and courses see the Graduate Studies section of the *Calendar*.

Requirements for the B.Sc. (Agr.) Degree

Students enrolled in the B.Sc.(Agr.) program in Animal Science can pursue several areas of special interest (e.g. genetics and breeding, biochemistry, nutrition, physiology, animal and poultry production, wildlife management, and aquaculture). Requirements for the different programs are shown below.

First Year

Course	Credits
AGSC 100	0
AGSC 200 or 210	3
BIOL 110 or 115 ¹	3 or 0
BIOL 120	3
CHEM 103 or 110 or 121/122	6
ECON 100 ²	0 or 6
ENGL 100-level ³	3 or 0
MATH 100, 120 or 140	3
MATH 101, 121 or 141	3
PHYS 100/101 or 101/102 or 121/122	6
Total	30

Second Year

Course	Credits
AGSC 200 or 210	3
AGSC 213	3
ANSC 258	3
BIOL 201	3
CHEM 230	6
AGSC 323	3
AGSC 220	3
ECON 100	6 or 0
ENGL 100-level ¹	0 or 3
Agricultural Sciences Electives ³	0 or 3
Total	30

Third and Fourth Years

Course	Credits
AGSC 300	2
ANSC 319	3
ANSC 320	3
ANSC 322	3
ANSC 498/499	3 or 6
Agricultural Sciences Electives ¹	9 or 6
AGSC 320	3
COMM 329	3
PLNT 321 ⁵	3
Electives ⁶	6 or 9
Program Requirements and Electives (see options below) ^{2,7} or 21	
Total	65

¹ BIOL 110 is open only to students who have not received credit for Biology 12. Students who have received a grade of at least 80% in Biology 12 will not be required to take either BIOL 110 or 115.

² Students not taking either BIOL 110 or 115 should complete ECON 100 in first year, and should defer ENGL 100-level to second year.

³ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121.

⁴ The program requires nine credits of courses within the Faculty but outside the student's Program Specialization. Agricultural Sciences electives must be approved by a Program Adviser.

⁵ FRST 231 or BIOL 300 may be substituted for PLNT 321, if approved by a Program Adviser.

⁶ Program Electives and Requirements must be approved by a Program Adviser.

Livestock Option

Course	Credits
ANSC 313	3
ANSC 321	3
ANSC 421	3
ANSC 422	3
ANSC 450	3
ANSC 460	3
Electives ⁶	6 or 9
Total	24 or 27
Program Total	125

Poultry Option

Course	Credits
ANSC 321	3
ANSC 406	3
ANSC 417	3
ANSC 421	3
ANSC 439	3
ANSC 450	3
Electives ⁶	6 or 9
Total	24 or 27
Program Total	125

Fish Option

Course	Credits
ANSC 313	3
ANSC 480	3
ANSC 481	3
ANSC 482	3
BIOE 506	3
BIOE 485	3
BIOL 302	3
BIOL 426	6
Total	27
Program Total	125

Wildlife Option

Course	Credits
ANSC 321	3
ANSC 421	3
FRST 202	3
FRST 395	3
FRST 495	3
An animal nutrition course numbered 400 or higher	3
Electives ⁶	6 or 9
Total	24 or 27
Program Total	125

Range Option

Course	Credits
ANSC 321	3
ANSC 422	3
ECON 370	3
FRST 202	3
PLNT 301	3
PLNT 401	3
PLNT 401	3
SOIL 415 or 416	3
Electives ⁶	0 or 3
Total	24 or 27
Program Total	125

Courses offered by other Departments and Faculties

When choosing electives students should consider courses offered in the following subjects: Agricultural Economics, Biochemistry, Biology, Bio-Resource Engineering, Chemistry, Commerce, Computer Science, Economics, Food Science, Forestry, Geography, Mathematics, Microbiology and Pharmaceutical Sciences.

Bio-Resource Engineering

The Department has teaching and research facilities for the study of biological and physical aspects of terrestrial and aquatic food production systems. The Department offers service courses for students who wish to choose electives related to the physical aspects of terrestrial and aquatic food production systems. Appropriate courses are BIOE 258, 300, 303, 306, 360 and 403. Other courses offered by the department may be selected with the prior approval of the Department Head. The Department offers an M.Sc. and for qualified students an Interdisciplinary Ph.D. program can be arranged in the following areas: Bio-environmental control and waste management, irrigation, drainage and hydrology, biomachine systems, food processing systems, and aquacultural systems. For departmental offerings in Bio-Resource Engineering refer to the Faculty of Applied Science.

Food Science

Food Science is a discipline which encompasses Food Chemistry, Physical Bromatology, Food Process Science and Structural and Environmental Bromatology, with respect to the manufacture, preservation, quality control and development of food products.

Students at the undergraduate level can pursue a general program or an area(s) of special interest through choice of elective courses. The minimum requirement of the Bachelor's degree program in the Department of Food Science is outlined below. Students wishing to specialize in or concentrate on certain areas should consult the Head of the Department.

The department offers M.Sc. and Ph.D. degree programs in the fields of Food Chemistry, Food Microbiology, Structural Bromatology, Environmental Bromatology, Physical Bromatology and Food Process Science.

Requirements for the B.Sc. (Agr.) Degree

First Year

Course	Credits
AGSC 100	0
AGSC 200	3
BIOL 110 or 115 ¹	3 or 0
BIOL 120	3
CHEM 105, 110 or 121-122	6
ECON 100	6
Electives ²	0 or 3
ENGL 100 level ³	3
MATH 100, 120 or 140	3
MATH 101, 121 or 141	3
Total	30

Second Year

Course	Credits
PHYS 101 or 121	3
AGSC 210	3
AGSC 220	3
AGSC 320	3
CHEM 230	6
MICB 201	3
MICB 202	3
BIOL 201 or BIOC 300	3 or 6
FOOD 250	3
Total	30 or 33

Third Year

Course	Credits
AGSC 300	2
AGSC 323	3
MICB 309	3
PLNT 321 ⁴	3
BIOL 300	3
FOOD 301	3
FOOD 302	3
FOOD 303	3
FOOD 308	3
FOOD 309	3
At least one of ANSC 322, HUNF 205, 305 or 307	3
Total	32

Fourth Year

Course	Credits
COMM 329	3
FOOD 401	3
FOOD 425	2
Food Science Electives ⁵	6
Agricultural Sciences Electives ⁶	9
Program Electives ⁷	3 or 6
Unrestricted Electives	6
Total	32 or 35
Program Total	127

¹ BIOL 110 is open only to students who have not received credit for Biology 12. Students who have received a grade of at least 80% in Biology 12 will not be required to take either BIOL 110 or 115. An appropriate substitution for BIOL 110 or 115 must be approved by a Program Adviser.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121.

³ FRST 251 or BIOL 300 may be substituted for PLNT 321, if approved by a Program Adviser.

⁴ Food Science electives to be chosen from FOOD 401, 402, 405, 410, 414, 416, 418, 499.

⁵ The program requires nine credits of electives selected from within the Faculty of Agricultural Sciences, but outside the student's Program Specialization. Agricultural Sciences electives must be approved by a Program Adviser.

⁶ Program electives must be approved by a Program Adviser, and can be chosen from various Departments, Schools and Faculties including: Agricultural Economics, Animal Science, Applied Science, Biochemistry, Bio-Resource, Engineering, Biology, Chemistry, Commerce and Business Administration, Computer Science, Economics, English, Forestry, Family and Nutritional Sciences, Food Science, Mathematics, Microbiology, Plant Science, Psychology, Soil Science.

Courses offered by other Faculties

Students may wish to select electives from the Departments of Biochemistry, Botany, Chemistry, Computer Science, Economics, Mathematics, Microbiology, Physics, Psychology and Zoology; from the School of Family and Nutritional Sciences (Human Nutrition); and from the Faculties of Applied Science, Commerce and Business Administration, and Education.

Plant Production and Protection

The department of Plant Science offers opportunities for study leading to Doctoral and Master's degrees and to the degree of Bachelor of Science in Agriculture, B.Sc. (Agr.). For information on the Ph.D. and M.Sc. degree programs, see the Faculty of Graduate Studies section of the *Calendar*.

The Plant Production and Protection program is developed upon a basic core of courses in the sciences and humanities common to programs leading to the B.Sc.(Agr.) degree. In addition, it includes courses central to plant science in the areas of genetics, physiology and ecology. Program specialization is then provided through advanced courses in plant production and protection. These courses include agronomy, range management, horticulture, crop physiology, plant pathology, weed science, genetic engineering, plant breeding, applied entomology, and tissue culture. Teaching and research facilities are located in the main Agricultural Sciences building (H. R. MacMillan Building), the Plant Science Annex, the Horticulture Building and greenhouses, and the Totem Park Field Station (which houses the landscape architecture studios) with its associated arable lands on the Totem and South Campus fields.

Requirements for the B.Sc. (Agr.) Degree

First Year

Course	Credits
AGSC 100	0
AGSC 200 or 210	3
BIOL 110 or 115 ¹	3 or 0
BIOL 120	3
CHEM 105 or 110 or 211/122	6
ECON 100	6
MATH 100, 120 or 140	3
PHYS 100, 101 or 121	3
ENGL 100-level ²	3
AGSC 220	0 or 3
Total	30

Second Year

Course	Credits
AGSC 210 or 200	3
BIOL 201	3
BIOL 210	3
AGSC 213 or equivalent	3
CHEM 230	6
SOIL 200	3
AGSC 220 ³	3 or 0
AGSC 320	3
Unrestricted Electives	6 or 3
Total	30

Third and Fourth Years

Course	Credits
AGSC 300	2
AGSC 323	3
PLNT 321 ⁴	3
PLNT 324	3
PLNT 331	3
PLNT 335	3
PLNT 336	3
PLNT 338	3
PLNT 433	3
COMM 329 ⁵	3
Program electives ⁶	18
Agricultural Sciences electives ⁷	9
Unrestricted electives	9
Total	65
Program Total	125

¹ BIOL 110 is open only to students who have not received credit for Biology 12. Students who have received a grade of at least 80% in Biology 12 will not be required to take either BIOL 110 or 115. The available three credits in first year should be completed with AGSC 220.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121.

³ FRST 251 or BIOL 300 may be substituted for PLNT 321, if approved by a Program Adviser.

⁴ If approved by a Program Adviser, students may substitute a course in Cultural Diversity for COMM 329.

⁵ Must include at least nine credits from the plant production courses (PLNT 408, 409, 410, 411, 417 and 418).

⁶ Selected from courses within the Faculty of Agricultural Sciences, but outside the area of Program specialization. Agricultural Sciences electives must be approved by a Program Adviser.

Rangeland Resources

In addition to the requirements listed above, students specializing in Rangeland Resources are required to take the following courses: BIOL 302 (3) or FRST 202 (3); ECON 370 (3); PLNT 258 (3), 304 (3), 326 (3), 401 (3), 404 (3), 408 (3).

Recommended electives include: AGECE 371 (3); AGSC 213 (3); ANSC 322 (3); FRST 412 or GEOG 370 (3); SOIL 416 (3).

Entomology

Courses of study in entomology are offered through the Department of Plant Science, the Faculty of Forestry and the Biology Program. The Department of Plant Science offers courses in economic entomology, insect ecology, insect physiology, pesticides, biological control and plant disease vectors. Forestry offers courses in insect ecology and the special problems of forest entomology and forest protection. The Biology Program offers an introductory course in general entomology, and insect ecology and physiology, cross-listed with Plant Science. The Department of Zoology maintains a museum collection and specialized library.

At the graduate level, research guidance is available in problems relating to classification, structure, function and bionomics of insects, as well as in specialized areas such as biological control, genetics and plant-insect relationships. There are also opportunities for graduate study in population biology, ecological genetics and mathematical modelling of biological processes. Cooperative research on ultra-structure, biology and population dynamics of plant viruses and plant-disease vectors can be arranged with the Vancouver Research Station of Agriculture Canada, located on campus.

Courses offered by other Departments and Faculties

Courses offered in other Departments and Faculties other than those recommended in the options listed above may be suitable for certain students.

Courses suitably complementary to programs of study in Plant Science are offered by other faculties and departments in the following subjects: Agricultural Economics, Biochemistry, Biology, Commerce, Computer Science, English, Food Science, Forestry, Geography, Geology, and Soil Science. Students are reminded that all programs of study must be approved by the Head of the Department.

Soil Science

The Department of Soil Science offers B.Sc.(Agr.), M.Sc. and Ph.D. degrees. Areas of study and research include not only pedology and the biology, chemistry and physics of soils, but also biometeorology, soil hydrology, the use of remote sensing and geographic information systems in evaluation of land-based resources, and applications of soil science in agriculture, forestry and environmental problem-solving.

The B.Sc.(Agr.) program in Soil Science prepares students for professional careers as soil scientists in the agricultural, environmental and forestry sectors, or for graduate studies in soil science and related fields. Core requirements include a broad preparation in several sciences, in addition to soil biology, soil chemistry, soil physics and pedology. Individual students' goals in education and career preparation are accommodated by the program's free electives and by five elective pools identified with science, agricultural sciences, soil science, soil management, and natural resources.

For information on M.Sc. and Ph.D. programs in Soil Science, see the Graduate Studies section of the *Calendar*.

Requirements for the B.Sc. (Agr.) Degree

First Year

Course	Credits
AGSC 100	0
BIOL 110 or 115 ¹	3 or 0
BIOL 120	3
CHEM 110 or 121/122	6
ENGL 100-level ²	3
GEOG 100 or 150	3
MATH 100 or 120	3
MATH 101 or 121	3
PHYS 101 or 121 ³	3
PHYS 102 or 122	3
Electives	0 or 3
Total	30

Second Year

Course	Credits
AGSC 200	3
AGSC 210	3
CHEM 205 ⁴	6
ECON 100	6
MICB 201 ⁵	3
SOIL 200	3
SOIL 201	3
Electives ⁶	6
Total	33

Third and Fourth Years

Course	Credits
AGSC 220	3
AGSC 300	2
AGSC 320	3
AGSC 323	3
COMM 329	3
PLNT 321 ⁷	3
SOIL 304	3
SOIL 313	3
SOIL 321	3
SOIL 416	3
SOIL 498 or 499	6 or 3
Electives ⁸	2 ⁷ or 30
Total	62
Program Total	125

¹ BIOL 110 is open only to students who have not received credit for Biology 12. Students who have received a grade of at least 80% in Biology 12 will not be required to take either BIOL 110 or 115. An appropriate elective substitution for BIOL 110 or 115 must be approved by a Program Adviser.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121.

³ Students who have not completed Physics 12 must take PHYS 100 before PHYS 101. In this case, PHYS 102 will normally be taken during Second Year. PHYS 100 will not qualify for elective credits in this program.

⁴ Either CHEM 201 plus three credits of approved additional CHEM or CHEM 208 may be substituted for CHEM 205.

⁵ MICB 201 may be substituted for MICB 417.

⁶ Approval by a Program Adviser is required before selection of electives. The total of 35 to 39 credits of electives includes nine credits within Agricultural Sciences, but outside of Soil Science (e.g., AGEC 37, LARC 340, PLNT 258 or 304); six credits chosen from CHEM 230, MATH 200, MATH 221, PHYS 200, PHYS 216, FRST 430 (or , with Department Adviser approval, other courses offered in Biology, Chemistry, Physics, Mathematics or Statistics); three credits chosen from SOIL 403, 415, 433, 435; three credits chosen from SOIL 308, 311, 417, 442, 443; three credits chosen from FRST 387, FRST 395, GEOG 205, GEOG 310, GEOG 415, GEOG 342, LAW 356, SOCI 360; and 9 to 15 credits of free electives.

⁷ FRST 251, BIOL 300 or STAT 200 may be substituted for PLNT 321, if approved by a Program Adviser.

Electives

When choosing electives, students should consider courses from the Faculties of Agricultural Sciences, Applied Science, Arts and Forestry and the Departments of Biochemistry, Biology, Chemistry, Computer Science, Economics, Geography, Geological Sciences, Geophysics, Mathematics, Microbiology, and Physics.

Landscape Architecture B.L.A.

The Landscape Architecture Program offers opportunities for study leading to the Bachelor of Landscape Architecture (B.L.A.) degree. For information on the M.L.A. degree program, see the Faculty of Graduate Studies section of the *Calendar*.

The landscape architecture studios are located in Totem Field at 2613 West Mall. The Landscape Architecture office is located in Room 346 of the MacMillan Building.

Admission

For admission to the Bachelor of Landscape Architecture program, students from Grade 12 British Columbia Schools must meet the general University admission requirements and must have completed English 11 and 12; Social Studies 11; French 11 or a foreign language 11; Mathematics 11 and 12; Biology 11 and either Chemistry 11 or Physics 11; a science course numbered 12 (Biology 12 strongly recommended); a social science 12. Students may also gain admission by transfer from a recognized university or college. Students transferring from other universities or colleges will be granted transfer credit for parallel courses in the first two years of the program up to a maximum of 45 credits for courses where the grade obtained exceeds the minimum passing grade.

It should be noted that completion of the academic requirements does not guarantee admission to the program.

Admission is restricted and selection is based on academic standing, commitment to the discipline, and creative capacity. The selection process entails completion of the standard UBC undergraduate admission application and completion of a supplementary Landscape Architecture Program application form. Both application forms may be obtained from the Registrar's Office. The UBC undergraduate admission application must be received

by the Registrar's Office by April 30. The supplementary Landscape Architecture Program application form must be received in the Landscape Architecture Program Office by May 15. A portfolio of creative work is a required element of the application. Portfolio requirements are described in the explanatory information that accompanies the Landscape Architecture Program application.

English Requirement as for the B.Sc. (Agr.) degree.

Requirements for the B.L.A. Degree

Candidates for the B.L.A. degree must complete a minimum of 125 credits. The program consists of a core of required courses and extensive lists of elective courses. The particular program of courses taken by a student in any year must be prepared in consultation with an assigned Faculty adviser.

On graduation, honours standing will be granted to those students who obtain an average of at least 80% in the best 60 credits of courses selected by the department which meet the requirements of the Third and Fourth years.

Deans' Honour List

Students with a standing of A- or better in the previous winter session will receive the notation "Dean's Honour List" on their records. A program of at least 30 approved credits must have been completed during the session to receive this designation.

First Year

Course	Credits
ENGL 100-level ¹	6
GEOG 101	6
FRST 111	6
SOIL 300 or 200	3
"Basics" electives ²	3
LARC 199	1
LARC 221	3
LARC 220	3
Total	31

Second Year

Course	Credits
LARC 205	6
LARC 206	6
LARC 251	3
LARC 251	1
LARC 355	3
"Basics" electives ³	3
GEOG 207	3
FRST 292	3
PLNT 316	3
Total	31

Third Year

Course	Credits
LARC 305	6
LARC 306	6
LARC 340	3
LARC 351	3
LARC 420	3
LARC 440	3
Environmental History Elective ⁴	3
Arts Elective	3
Recommended Elective ⁵	3
Total	33

Fourth Year

Course	Credits
LARC 405	6
LARC 499	6
LARC 451	3
LARC 454	3
ARCH 472	3
Arts Electives ⁶	3
Recommended Elective	6
Total	30

¹ A student must obtain credit for two of ENGL 110, 111, 112, 120 and 121. ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121.

² Incoming students choose "Basics" electives in consultation with an adviser before beginning their course of study in the program. This choice is based on a student's previous performance in arts and sciences at the high school and post-secondary level. Electives from this group are chosen to provide students with the prerequisites required for their chosen electives program concentrations.

³ During the program, students are required to complete six credits of course work from the Faculty of Arts, exclusive of courses in the required core or in the lists of recommended electives. A partial list of available general Arts electives is provided in the Landscape Architecture Program application brochure.

⁴ A list of acceptable electives in environmental history is available through the Landscape Architecture Program office.

⁵ Students shall choose these electives in consultation with their adviser to support their electives program concentrations (the electives program concentration is initiated in year one with their choice of "basics" electives).

Human Nutrition Program in Nutritional Sciences B.Sc.

This program is offered by the School of Family and Nutritional Sciences, the Faculty of Agricultural Sciences and the Faculty of Science. The Human Nutrition Major in Nutritional Sciences is available to students registered in the Faculty of Science. Students should consult the Faculty of Science section of the *Calendar* for the general Faculty requirements and regulations pertaining to the Major.

The program in Nutritional Sciences is specifically intended for those students interested in basic nutritional sciences, who desire preparation for graduate study and research in Nutrition, and for students who plan to proceed to an area of Agricultural or Health Sciences in which a background in nutrition would be of value. All students take required courses in both animal (comparative) and human nutrition, but each student may select additional courses to emphasize one area or the other.

Before registering for each of the Second, Third and Fourth years of this program, every student must obtain formal program approval from an adviser in either the School of Family and Nutritional Sciences or the Faculty of Agricultural Sciences.

First Year

Course	Credits
BIO1 110 or 115 ¹	3-0
BIO1 120	3
CHEM 121, 122 (110)	6
ENGL 100-level ²	6
PHYS 101 ³	6-3
MATH 100, 101	6
Electives ⁴	0-6
Total	30

Second Year

Course	Credits
BIO1 200, 201	6
CHEM 230	6
MICB 201	3
MICB 202	3
Electives ⁵	12
Total	30

Third Year

Course	Credits
BIOC 301, 302	6
BIO1 300	3
BIO1 363	6
HUN1 305, 307	6
Electives ⁵	9
Total	30

Fourth Year

Course	Credits
ANSC 321 or FOOD 301 ⁶	3
ANSC 323 or HUN1 309 ⁶	3
ANSC 425	3
BIO1 354, 355	6
Electives ⁷	15
Total	30

¹ Students with at least 80% in Biology 12 are not required to take BIO1 110 or 115 and instead are encouraged to take three credits of BIO1 courses. BIO1 120 is required of all students.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121. Three credits of first-year English may be deferred until second year.

³ Students without credit for Physics 12 will require PHYS 100 prior to PHYS 101.

⁴ Chosen from 100-level Arts or Science courses or 200-level BIO1 courses.

- ⁵ Electives must satisfy the following:
- (i) At least 12 credits must be for courses numbered 300 or higher. At least six of these must be in Arts or Science. HUN1 305, 405, 407, 411, 419, 467; ANSC 420; FOOD 302, 402, 418 may not be used to satisfy the Arts and Science requirements.
 - (ii) At least 12 credits must be in the Faculty of Arts (in addition to six credits of 100-level English).
 - (iii) Six credits can be in any faculty including Science and can be within the field of the Major.
 - (iv) Of the remaining credits, nine must be either Science electives outside the field of the Major, or in Arts. The field of the Major for Nutritional Sciences is defined as all courses in Human Nutrition, Animal Science, Food Science, Biochemistry, Biology, Microbiology, and Physiology.

⁶ Students must take either Sequence A: ANSC 321 and 323, or Sequence B: FOOD 301 and HUN1 309.

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The Vancouver Research Station of Agriculture Canada conducts multidisciplinary research at the cellular and molecular level on viruses, bacteria and fungi of significance to agricultural crops. The Station breeds new cultivars of raspberries and strawberries, and develops integrated management controls of nematodes, insect pests and plant diseases of crops in the coastal region. Research is also carried out on land evaluation, degradation and interpretation of B.C. soils.

The Station is on the Campus at 6660 N.W. Marine Drive, and co-operates closely with the Faculty of Agricultural Sciences.

The Dr. and Mrs. A. S. Dekaban Foundation

The Foundation was established by Dr. and Mrs. A. S. Dekaban primarily to permit graduate students from the Polish agricultural universities to study in the Faculty of Agricultural Sciences. Polish students may spend up to six months in the Faculty, undertaking research related to their study program in their home institution. The students are selected by the Polish agricultural universities. The Foundation also supports occasional short-term visits by members of the Faculty of Agricultural Sciences to Polish agricultural universities and visits by scientists from the Polish agricultural universities to the Faculty.

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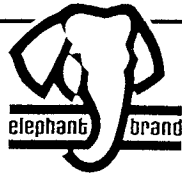
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Bachelor of Applied Science – B.A.Sc.

The Faculty offers programs of undergraduate study leading to the Bachelor of Applied Science (B.A.Sc.) degree in the following areas of engineering:

- Bio-Resource Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Geological Engineering
- Mechanical Engineering
- Metals and Materials Engineering
- Mining and Mineral Process Engineering
- Engineering Physics

The Faculty of Applied Science admits suitably qualified applicants directly from secondary school into first-year Engineering. These students will normally complete the B.A.Sc. degree in four years, except in the case of Engineering Physics which requires five years. Students may also enter the Engineering program after spending one or more years in the Faculty of Science, either because they wish to avail themselves of a broader range of electives or because they do not meet the entrance requirements for admission directly from secondary school (see below). Depending on the transfer credit in Engineering received from first-year Science (see below under "Admission from Science"), such students may be able to complete an engineering degree with three further years of study, otherwise they will require four further years.

Scheduled field trips, and the activities of professional and technical societies all contribute to the rounding out of the undergraduate programs and students are expected to participate in them as fully as circumstances permit. Extension of engineering studies at the post-graduate level is becoming increasingly important. The Faculty offers post-graduate programs leading to the degrees of Master of Applied Science, Master of Engineering and Doctor of Philosophy, and provides research facilities, in many areas of engineering. The requirements for admission to these programs are set out in the Faculty of Graduate Studies section of the *Calendar*.

Part-Time Study

The Faculty will consider proposals from qualified applicants for part-time study towards the degree of B.A.Sc. Since the flexibility for such study may be limited, approval must be obtained from the Office of the Dean.

The M.Eng. degree may be obtained by part-time study in all departments. Part-time study towards the M.A.Sc. degree is permitted in some departments.

Admission

Undergraduate Programs

Application for admission to the Engineering program must be made through the Registrar's Office not later than April 30. All supporting documents, including official transcripts, must be received by the Registrar's Office by June 30, otherwise the application will not be considered. The applicant is responsible for ensuring that official transcripts are received by June 30.

Due to limited resources, the Faculty has been authorized to restrict enrolment in first-year Engineering, and within individual Engineering programs at the second year level. Attainment of the minimum academic requirements listed below means that the applicant is eligible for selection,

The Faculty of Applied Science

The Faculty of Applied Science offers undergraduate and graduate programs in Engineering, Architecture, and Nursing.

Seven Departments and two Boards of Study offer programs in Engineering. The two Schools in the Faculty, Architecture and Nursing, offer programs in their respective disciplines, which are described in separate sections of the *Calendar*. In addition, the Faculty contains the Centre for Metallurgical Process Engineering listed at the end of the *Calendar* entry for this Faculty.

but does not provide assurance of admission. The selection is based on academic standing. For most engineering programs, the competition for places is such that standing above the minimum prescribed requirements is necessary to ensure admission.

Mathematics

The attention of applicants is drawn to the importance of mathematics as a preparation for engineering courses. Experience has shown that UBC students with grades below 65% in mathematics (below "B" at a college) are likely to have difficulty with many engineering courses.

Admission from B.C. Grade 12 (or the equivalent)

In addition to satisfying general University admission requirements, applicants must have completed Mathematics, Physics, and Chemistry at the British Columbia Grade 12 level, or the equivalent. Students will be selected on the basis of their standing in Grade 12 courses in Mathematics, Chemistry, Physics and English. Applicants from schools where either Physics 12 or Chemistry 12 is not available may petition to be excused this deficiency.

Note: The University is prepared to offer early admission to Secondary School students graduating in June based on interim or projected final grades submitted by the schools.

Admission From Science

Applicants who have taken first-year Science at UBC are eligible to be considered if they have achieved an overall average of at least 55% on all courses, including any failed courses, and at least 60% in each of Chemistry, Physics and Mathematics (60% average in MATH 100 and 101, minimum 60% in MATH 101). Applicants from a college or another university are eligible for consideration if they have achieved an overall gradepoint average of at least 2.5, including any failed courses, with a gradepoint average of at least 2.7 in Mathematics, Physics and Chemistry with no grade less than "C" in these subjects.

Applicants registered in Science who have taken 60 or more credits must normally have an average of at least 60 per cent on all courses taken in their most recent 60 credits of study in Science, including any failed courses.

Applicants from first year at an approved university or college should normally have taken the following prerequisite subjects (applicants who are deficient in one or more of these subjects should consult the Office of the Dean of Applied Science):

Course	Credits
CHEM 110 (or 121 and 122)	6
ENGL 112 or another first-year English course	3
MATH 100 and 101 (or 120 and 121)	6
PHYS 101 and 102 (or 121 and 122)	6
Appropriate electives	9
Total	30

Applicants with more than 24 credits of transfer credit in first-year Engineering may be eligible for second-year Engineering, depending on the program which they wish to enter and the transfer credit received. Advice on transfer credit is available from the Applied Science Dean's Office. Applicants admitted to second year may be able to complete their Engineering program in three years following first-year Science, depending on the first-year Engineering courses that they lack and the arrangements that they can make for completing these courses. These applicants must obtain a "Second Year Program Preference Form" from the Applied Science Dean's Office and return the completed form to the Dean's Office by **June 15**.

Exemptions are given for courses in first-year Applied Science for the following courses normally taken in first-year Science at UBC:

Course	Exemption
CHEM 110 (or 121 and 122)	CHEM 151
MATH 100 or 120	MATH 153
MATH 101 or 121	MATH 151
PHYS 101 and 102 (or 121 and 122)	PHYS 153

The following courses, which can be taken as electives in first-year Science, also give the exemptions indicated:

Course	Exemption
CPSC 111	CPSC 152
CPSC 121 and 126 (Pair)	CPSC 152 and 128 (Pair)
MATH 221 or 225	MATH 152
PHYS 216	PHYS 170

MATH 221, or equivalent, is required for students wishing to enter Electrical Engineering or Mechanical Engineering.

Successful completion of Science One (from UBC) provides transfer credit for first year Engineering for CHEM 151, MATH 153, MATH 154 and PHYS 153.

Applicants with 24 or fewer credits of transfer credit in Engineering will normally enter first-year Engineering and take a program similar to the "Typical Transfer Program Following First-Year Science" shown below. They will normally require four years following first-year Science to complete their Engineering programs.

Admission from UBC Engineering Transfer Programs

Students who have completed first-year Engineering at a college offering a UBC transfer program are eligible to be

considered for admission to second year Engineering provided that they have obtained an overall grade point average of at least 2.5.

Admission Following Two-Year Technology Diploma Programs

Students are eligible to be considered for admission if they have completed an appropriate two-year Technology Diploma Program with an overall average of at least 70%. Admission is normally into first-year Engineering.

Mature Students (B.C. Residents Only)

Applicants who do not meet the normal University or Faculty requirements for admission, but who have relevant work experience in Engineering, may be considered for admission. Mature student applications are considered on an individual basis.

Degree Requirements

A student shall be granted a B.A.Sc. degree only after obtaining credit for all courses listed in the program of study for a given Engineering Program. This requirement will normally be met by completing four Winter Sessions with full credit load (five Winter Sessions for Engineering Physics). With the approval of the Office of the Dean, a student may be allowed to study on a part-time basis. Credit will be granted for courses completed during the Summer Session.

A student transferring from an Engineering program at another university or from a Science Faculty may be granted transfer credit for courses if the student has completed courses of equivalent content.

Dean's Honour List

Students in any Winter Session with a sessional average of at least 80% while taking 30 or more credits will receive the notation "Dean's Honour List" on their record.

Degree with Distinction

On graduation a student will be granted a degree with Distinction if they obtain an average of not less than 80% in the Winter Session of the Final Year and **either** a minimum of 75% in each of the preceding two Winter Sessions **or**, if the minimum of 75% is not achieved in one or more of the preceding two Winter Sessions, an overall average in the three years of 80% or higher. To be eligible, students must have had full-time status for all four years, with no failed courses.

Elective Courses in Engineering Program

Students are advised that enrolment in elective courses offered within the Faculty may be restricted.

English Requirement

To qualify for the degree of B.A.Sc. a student must complete English 112 (or another first-year English course) and a three-credit technical writing course. Successful completion of the Language Proficiency Index Examination (LPI) is normally required for admission to first-year English courses (see *Calendar* Index under Language Proficiency Examination). Registration in the final 30 credits of the degree program will not be permitted until a student has completed three credits of first-year English.

Complementary Studies Courses

Students must take complementary studies courses totaling at least 21 credits. The minimum requirements are as follows (except for Chemical Engineering, which requires an additional three credits of humanities or social science courses):

- 1) Professional Development
 - APSC 121 – 1 credit
 - APSC 450 (or equivalent) – 2 credits
- 2) English
 - ENGL 112 (or another first-year English Course) – 3 credits
 - APSC 201 or ENGL 301* (Technical Writing) – 3 credits
- 3) Engineering Economics – 3 credits

All engineering programs include a three-credit engineering economics course, usually taken in third or fourth year. Approved courses include: CHML 359, CIVL 300, ELEC 450, MECH 431, MMAT 466, and MMPE 396.
- 4) Impact of Technology on Society – 3 credits

Acceptable courses include: APSC 261 (3), APSC 262 (3), CPSC 430 (3), GEOG 210 (3), GEOG 260 (3), GEOG 310 (3), GEOG 415 (3), HIST/PHIL 115 (6), HIST 215 (6), HIST 425 (6), PHIL 433 (3), POLI 361 (3/6), SOGI 260 (3/6), URST 200 (6). Students may seek approval from the Dean's Office for other courses in this area.
- 5) Humanities and Social Sciences Electives – minimum 6 credits.

(Chemical Engineering – minimum 9 credits.)

In general, scientific geography courses, statistical courses, studio/performance courses in fine arts, music and theatre, will not satisfy this requirement. Introductory language courses in a student's first language are not acceptable. Guidelines for acceptable courses are available from the Dean's Office.

* Available only to students who have completed six credits of first-year English courses; places in the course are limited.

Student Classification

Regular students are considered to be "full time" or "part time" as follows:

In order to be considered as "full time", a student must carry a credit load in the Winter Session which is equal to at least 80% of the standard credit load for the year and program in which the student is registered. A student may take more than the full credit load with the approval of the Office of the Dean. Note that the Faculty's definition of full time status may not be the same as that used by the Awards Office in determining eligibility for financial assistance. Students wishing to ensure that they are eligible for consideration for scholarships or other forms of award should check with the Awards Office.

A student who has approval for a credit load in a Winter Session which is less than that required for full-time status shall be considered as a "part-time" student. A part-time student will not normally be eligible for scholarships or for a degree with Distinction.

A student who is taking courses from more than one year level shall normally be given year status based on the program year of the majority of credits being taken.

Examinations

Examinations are held in December and in April. In any course which includes both lecture and laboratory work, a student must complete the laboratory assignments with satisfactory standing before being admitted to the written examination of the course and must pass in the material of both components before standing will be granted in the subject. The minimum passing mark in each course is 50%.

Applications for special consideration for examinations missed on account of illness or domestic affliction must

be submitted to the Dean before or immediately after the missed examination(s). For information regarding medical certificates see the General Information section of the *Calendar*.

Advancement

In order to pass the year, a student must **both** obtain an overall average of at least 55% in the Winter Session **and** pass in 65% of credits taken. A student who fails a year will be required to discontinue studies in the Faculty for at least one year but is eligible to apply for readmission after that year. A student who fails a second time will be required to withdraw.

In a failed year a student will be granted credit for all courses passed.

A student who withdraws during the second term of the Winter Session after obtaining less than 55% on the Christmas examinations will not be readmitted for the following Winter Session but is eligible to apply for readmission after that year.

Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.

Supplemental Examinations

A student in a Winter Session who is not classified as "Fail" but who has failures in some courses, may write a supplemental examination in each failed course in which a supplemental examination is available, and in which a final grade of not less than 40% has been achieved. Such examinations may be written only once, normally during the supplemental examination period in July-August but not in December. In the fourth year a supplemental may be written twice.

Supplemental examinations for courses which terminate at Christmas will normally be made available to students only during the supplemental examination period in July-August.

Appeals

A student may appeal an admission or year standing decision to the Committee on Admissions, Standing and Courses. Letters of appeal should be directed to the Registrar's Office.

Field Trips

Students who are required to participate in field trips will be responsible for expenses incurred in such trips.

Co-operative Education Programs

The Engineering Co-operative Education Program is intended to provide interested and qualified students in Civil, Chemical, Electrical, Mechanical, Metals and Materials, and Engineering Physics with work experience relevant to their future careers. It is optional and is available as follows:

- a summer-only program entailing three consecutive summer work terms, available in Engineering Physics. (See Engineering Physics section for further details.)
- a year-round program entailing three summer placements and, in addition, one Winter Session Term 1 placement and one Winter Session Term 2 placement, necessitating an additional year to complete the B.A.Sc. requirements. This pattern normally, requires five work terms.
- Students intending to enter these programs must apply in the fall term of their second year.

Faculty advisers or co-ordinators visit students at their places of work and provide advice on the technical reports that are a requirement of the program.

Students who wish to be considered for the program must meet all requirements of the Faculty of Applied Science (Engineering) and will be selected on the basis of academic performance and suitability for the work environment. The total enrolment is subject to the availability of appropriate work placements. Accepted students will register in the appropriate non-credit Co-operative Education courses (see Applied Science courses in the "Courses of Instruction" section) for each work term, once a suitable position is confirmed, and will be required to pay a Co-operative Education Program fee (see Index for Fees — Special Fees). Completion of each of these courses, including a technical report will be recorded on the student's transcript.

In order to graduate in either the summer-only or the year-round Co-operative Education Program, a student must have completed the required number of work placements satisfactorily, in addition to the normal academic requirements.

For further information on Co-operative Education Programs please contact the Engineering Co-operative Education Office, Room 2205, CEME Building, 2324 Main Mall, Vancouver, B.C. V6T 1Z4; telephone (604) 822-3022 or fax (604) 822-349.

Professional Associations

The right to practise engineering and accept professional responsibility in Canada is limited to those who are registered members of the Association of Professional Engineers in the Province concerned. During the period between graduation and registration, the graduate who intends to practise in B.C. should be enrolled with the Association as an "Engineer in Training".

All of the B.A.Sc. degree programs at UBC are accredited by the Canadian Engineering Accreditation Board (C.E.A.B.) of the Canadian Council of Professional Engineers. Graduates of C.E.A.B.-accredited programs are accepted as being fully qualified academically for professional engineering registration anywhere in Canada. However, there are also experience qualifications and professional practice requirements that must be fulfilled before full registration is granted. These qualifications vary within Canada and applicants should obtain the necessary details from the appropriate Association(s).

Bio-Resource Engineering

Bio-Resource Engineering is concerned with the application of engineering principles to biologically based systems. It incorporates basic knowledge of the biological sciences into engineering practice. Building on a core of engineering courses, students may pursue a specialization through their choice of elective courses (28 credits out of a total of 83 in third and fourth years) in the following two interrelated areas:

- 1) Environmental Engineering
- 2) Bioprocess Engineering

Please consult with the student adviser in the Department of Bio-Resource Engineering for details of the technical elective courses.

Second Year

Course	Credits	Term
APSC 201	3	1
BIOE 250	3	1

BIOE 251	3	Biological Systems Engineering	2
BIOE 285	3	Intro to Bio-Resource Engineering Analysis	2
CHEM 260	4	Organic Chemistry	Both
CHEM 251	3	Transport Phenomena I	2
CIVL 228	3	Mechanics in Civil Engineering Design	1
CIVL 230	3	Solid Mechanics	1
CIVL 235	1	Plane Surveying (End of 2nd Term, 1st Year)	1
MATH 253	3	Multivariable Calculus	1
MATH 251	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
Plus	3	Complementary Studies Electives*	2
Total	41		

Third Year

Course	Credits	Term	
BIOE 355	3	Physical Properties of Plant and Animal Materials	1
BIOE 356	3	Principles and Engineering Applications of Plant and Animal Physiology	2
BIOE 361	3	Soil and Water Engineering	2
BIOE 376	3	Applications of Heat, Mass and Momentum Transfer	2
BIOE 390	3	Biological Waste Systems Design and Management	1
CHEM 351	3	Transport Phenomena II	1
CHEM 359	3	Chemical Engineering Economics	2
ELEC 263	3	Basic Circuit Analysis	1
MATH 257	3	Partial Differential Equations	2
MCIB 417	3	Introduction to Applied Microbiology	1
SOIL 313	3	Soil Physics	1
STAT 251	3	Elementary Statistics	2
Plus	6	Technical electives selected in consultation with the department before the end of second year.	
Total	42		

Fourth Year

Course	Credits	Term	
APSC 450	2	Professional Engineering Practice	1
BIOE 471	3	Systems Design I	1
BIOE 489	2	Seminar	Both
BIOE 499	6	Thesis	Both
Plus	24	Technical electives selected in consultation with the department before the end of third year with a minimum of nine credits taken from department offerings	
Plus	6	Complementary Studies Electives (3 in each term)	
Total	43		

Chemical Engineering

Second Year

Course	Credits	Term	
APSC 201	3	Technical Communication	1
APSC 278	3	Engineering Materials	1
CHEM 250	2	Inorganic Chemistry	2
CHEM 251	3	Physical Chemistry I	1
CHEM 252	2	Physical Chemistry II	2
CHEM 255	2	Chemistry Lab	Both
CHEM 260	4	Organic Chemistry	Both
CHML 241	3	Mass and Energy Balances	1
CHML 242	2	Chemical Process Technology	2
CHML 251	3	Transport Phenomena I	2
CHML 261	1	Chemical Engineering Laboratory I	2
CHML 345	2	Applied Thermodynamics I	2
MATH 253	3	Multivariable Calculus	1
MATH 254	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
MATH 257	3	Partial Differential Equations	2
Total	42		

Third Year

Course	Credits	Term	
CHEM 352	3	Analytical Chemistry	Both
CHML 341	3	Diffusional Operations I	2
CHML 345	2	Applied Thermodynamics I	1
CHML 346	2	Applied Thermodynamics II	2
CHML 351	3	Transport Phenomena II	1
CHML 353	2	Mechanical and Thermal Operations	1
CHML 356	3	Process Control	2

CHML 357	2	Interfacial Phenomena	2
CHML 358	2	Properties of Fluids	2
CHML 359	3	Chemical Engineering Economics	2
CHML 362	2	Chemical Engineering Lab II	1
CHML 363	2	Chemical Engineering Lab III	2
ELEC 263	3	Basic Circuit Analysis	1
STAT 251	3	Elementary Statistics	1
Plus	6	Complementary Studies Electives (3 credits in each term)	
Plus	2	Technical Electives	2
Total	43		

Fourth Year

Course	Credits	Term	
APSC 450	2	Professional Engineering Practice	1
CHML 442	3	Diffusional Operations II	1
CHML 454	6	Process Design Project	Both
CHML 455	6	Chem. Eng. Reactor Design	Both
CHML 457	2	Process Synthesis	1
CHML 464	3	Chemical Engineering Lab IV	1
CHML 491	1	Thesis Proposal	1
CHML 492	5	Thesis	2
CHML 498	2	Summer Essay - Summer Task	
ELEC 370	3	Electrical Machines and Power Transmission	2
Plus	4	Technical Electives - 2 credits in each term	
Plus	6	Complementary Studies Electives* (3 credits in each term)	
Total	43		

Chemical Engineering - Chemistry Honours

The Chemical Engineering - Chemistry Honours program is jointly administered by the Departments of Chemical Engineering and Chemistry. Enquiries regarding the program and student advising should be made to the faculty advisers in either Department.

The completion of the B.A.Sc. degree in Chemical Engineering - Chemistry Honours will normally take five years of university study. Entry to the program is normally from first-year Applied Science. To obtain permission to enter the program students must consult faculty advisers in the Departments of Chemical Engineering and Chemistry.

The five-year Chemical Engineering - Chemistry Honours Program has an integrated sequence of Chemistry courses which are different from those in the regular four-year Chemical Engineering program. Because of this and other differences between the programs, transfer from one to the other becomes progressively more difficult after first year. Students who complete four years of the combined program (including fourth-year Chemical Engineering) would have a number of deficiencies to make up if they wished to graduate at that point with a B.A.Sc. in Chemical Engineering.

Students who satisfactorily complete the program and who obtain a minimum overall 65% average in their chemistry courses numbered 300 and higher, will receive a B.A.Sc. in Chemical Engineering - Chemistry Honours.

Second Year

Course	Credits	Term	
APSC 201	3	Technical Communication	2
CHEM 201	3	Physical and Analytical Chemistry	1
CHEM 202	3	Inorganic and Analytical Chemistry	2
CHEM 205	6	Organic Chemistry	Both
CHML 241	3	Mass and Energy Balances	1
CHML 242	2	Chemical Process Technology	2
CHML 251	3	Transport Phenomena I	2
CHML 261	1	Chemical Engineering Laboratory I	2
CHML 345	2	Applied Thermodynamics I	2
MATH 253	3	Multivariable Calculus	1
MATH 254	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
MATH 257	3	Partial Differential Equations	2
ELEC 263	3	Basic Circuit Analysis	1
Total	41		

* Please refer to the statement headed "Complementary Studies Courses" above.

† Chosen in consultation with Director.

Third Year

Course	Credits	Term
CHEM 304	6	Both
CHEM 311	1	Both
CHEM 312	1	Both
CHEM 314	3	2
CHEM 345	2	1
CHEM 346	2	2
CHEM 351	3	1
CHEM 353	2	1
CHEM 356	3	2
CHEM 358	2	2
CHEM 359	3	2
CHEM 362	2	1
CHEM 363	2	2
Plus	3	1
Total	41	

Fourth Year

Course	Credits	Term
APSC 450	2	1
CHEM 357	2	2
CHEM 312	3	1
CHEM 354	6	Both
CHEM 355	6	Both
CHEM 357	2	1
CHEM 464	3	1
CHEM 498	2	1
CHEM 350	6	Both
ELEC 370	3	2
STAT 251	3	2
Plus	6	1
Total	44	

Fifth Year

Course	Credits	Term
CHEM 310	6	Both
CHEM 315	1	Both
CHEM 449	6	Both
CHEM 491	1	1
CHEM 492	5	2
CHEM	6	1
Plus	6	1
Total	34	

¹ In the total program students must take one of CHEM 449, or CHEM 491 and 492. If CHEM 449 is not taken it must be replaced by 6 credits of 400-level CHEM electives. The CHEM electives must include at least one course chosen from CHEM 405, CHEM 406 or CHEM 412. If CHEM 491 and 492 are not taken they must be replaced by six credits of CHEM electives.

Civil Engineering

Within the Civil Engineering program, students may enrol in an Environmental Engineering Option which begins in third year. The Environmental Engineering Option is a modification of the regular Civil Engineering program in which environmental courses replace some of the regular program core courses in the third and fourth years of study. Interested students should apply for Civil Engineering (Environmental Engineering Option) after completing first year Engineering, or after second year if transferring from another institution. Prospective students should be aware that an enrolment limit applies.

Regular Civil Engineering Program

Second Year

Course	Credits	Term
APSC 201	3	2
CIVL 200	3	2
CIVL 210	3	2
CIVL 215	3	1
CIVL 220	3	2
CIVL 225	3	2
CIVL 228	3	1
CIVL 230	3	1

CIVL 231	3	2
CIVL 235	1	1
GEOL 150	3	1
MATH 253	3	1
MATH 254	3	2
MATH 255	3	1
Total	43	

¹ CIVL 200 counts towards requirement 4 under "Complementary Studies".

Third Year

Course	Credits	Term
CIVL 300	3	2
CIVL 301	3	2
CIVL 306	3	2
CIVL 310	3	1
CIVL 311	3	2
CIVL 315	1	1
CIVL 316	1	2
CIVL 321	2	1
CIVL 331	3	2
CIVL 332	3	1
CIVL 340	3	2
MATH 257	3	1
STAT 251	3	1
Total	40	

Fourth Year

Course	Credits	Term
CIVL 400	3	2
CIVL 402	2	2
CIVL 405	3	1
CIVL 410	3	1
CIVL 415	3	2
CIVL 430	3	1
CIVL 436	3	1
CIVL 445	3	Both
Plus	6	1
Plus	9	1
Total	38	

¹ Technical Electives are to be chosen in consultation with departmental advisers and approved by the Head of the Department.

Environmental Engineering Option

Third Year

Course	Credits	Term
CHEM 301	3	1
CIVL 300	3	2
CIVL 301	3	2
CIVL 306	3	2
CIVL 310	3	1
CIVL 311	3	2
CIVL 315	1	1
CIVL 316	1	2
CIVL 331	3	2
CIVL 332	3	1
CIVL 340	3	2
GEOL 442	3	1
MATH 257	3	1
STAT 251	3	1
Total	41	

Electrical Engineering

In addition to the regular Electrical Engineering program, there are two options, Honours Mathematics and Computer Engineering, as described below.

Many third-year Electrical Engineering courses, and CPSC 310, are offered in both terms to accommodate students in the year-round Co-operative Engineering program.

Engineering Economics Requirement

ELEC 450 (three credits) Economic Analysis of Engineering Projects, was introduced as a core course in 1988/89 as part of the new complementary studies requirement (which replaced the former applied humanities require-

ment). Students already in the Faculty prior to 1987/88 have the option of completing either the former applied humanities requirement or the new complementary studies requirement. For those who elect to satisfy the former applied humanities requirement, ELEC 450 is not a core course but, if taken, can be counted as an elective. For those who elect to satisfy the new complementary studies requirement, ELEC 450 is a core course and must be taken in fourth year.

Regular Electrical Engineering Program

Second Year

Course	Credits	Term
CPSC 128	3	1
ELEC 251	3	1
ELEC 253	3	2
ELEC 254	3	2
ELEC 256	3	1
ELEC 259	3	2
ELEC 261	3	2
ELEC 280	2	1
ELEC 281	2	1
MATH 253	3	2
MATH 254	3	2
MATH 255	3	1
Plus	6	1
Total	40	

Third Year

Course	Credits	Term
APSC 201 ¹	3	2
ENGL 301 ¹	3	2
CPSC 216 ²	3	2
ELEC 314 ²	3	2
ELEC 351	3	1
ELEC 356	3	1
ELEC 359	3	1
ELEC 360	3	2
ELEC 364	1	2
ELEC 371	3	1
ELEC 372	3	1
ELEC 380	1	1
ELEC 381	1	2
MATH 257	3	1
MATH 350	3	1
STAT 251	3	2
Total	45	

¹ Credit will be given for only one of APSC 201 or ENGL 301.

² Electrical engineering students who do not intend to register for additional Computer Science courses may take ELEC 314 instead of CPSC 216. Students who do intend to register for additional Computer Science courses must take CPSC 216.

Fourth Year

Course	Credits	Term
APSC 450	2	1
ELEC 450	3	2
ELEC 452 ¹	3	1
ELEC 474	1	1
ELEC 475	1	2
ELEC 498	2	Both
Plus	4	1
Total	42	

¹ Students who enter fourth year with credit for ELEC 352 will be required to replace ELEC 452 with a three-credit technical elective. Credit is given for only one of ELEC 352 and ELEC 452.

² Electives total 24 credits with at least 18 credits from groups A, B and C below, with at least three credits from each. The remaining six credits are to be selected from a list made available by the Department in March.

* Please refer to the statement headed "Complementary Studies Courses" above.

¹ Chosen in consultation with Director.

Fourth Year Electives

All are one-term courses except those with an asterisk (*), which are two-term.

A. Signals, Communications, Control

Course	Credits	
ELEC 455*	6	Communications Systems
ELEC 460	3	Control Systems
ELEC 461	3	Non-Linear and Optimum Systems
ELEC 466	3	Digital Signal Processing Systems
ELEC 468	3	Digital Process Control

B. Electrophysics

Course	Credits	
ELEC 469	3	Microwave Engineering
ELEC 470	3	Microwave Circuits
ELEC 479	3	Integrated Circuit Engineering
ELEC 480	3	Semiconductor Devices
ELEC 482	3	Optical Waveguides and Photonics
ELEC 483	3	Antennas and Propagation

C. Systems, Technology, Applications

Course	Credits	
ELEC 456	3	Computer Communications
ELEC 457	3	RF Electronics
ELEC 463*	6	Power Systems Analysis
ELEC 464	3	Microprocessor Systems Design
ELEC 472	3	Transducers and Advanced Instrumentation and Measurement
ELEC 476	3	Introduction to Computer Architecture
ELEC 478	3	Computer Graphics
ELEC 486	3	Optimization Methods for System Design
ELEC 487	3	Introduction to Robotics
ELEC 493	4	Power Electronics
ELEC 494	3	Real-Time Digital System Design
ELEC 495	4	Industrial Drives

D. Other Courses

Course	Credits	
ELEC 490	3	Topics in Electrical Engineering I
ELEC 491	3	Topics in Electrical Engineering II

Honours Mathematics Option

It is possible for students in Electrical Engineering to complete, in addition to the Electrical Engineering Program, the basic Mathematics requirement of a combined Honours degree in Mathematics, by:

- obtaining 65% in MATH 226/227 or MATH 253/254 (MATH 220 is recommended for students taking MATH 253/254).
- obtaining a 65% average in the following courses: MATH 300 and 301 (instead of 350), 320, 321, 400, 401 and three additional credits chosen from MATH 322, 323, 402, 403, 416-429, 449.

Students who satisfactorily complete such a program will be given recognition as receiving the B.A.Sc. in Electrical Engineering (Honours Mathematics Option). Note that for students who enter Engineering directly from high school, some summer courses or additional winter session terms will probably be necessary in order to accommodate the extra load of the Honours Mathematics Option.

Students interested in undertaking this program should consult Undergraduate Student Advisers in the Departments of Electrical Engineering and Mathematics.

Computer Engineering Option

The Computer Engineering Option in Electrical Engineering is a modification of the regular Electrical Engineering program in which Computer Science courses replace some of the regular program core courses. Students who satisfactorily complete the following program will be given recognition as receiving the B.A.Sc. in Electrical Engineering (Computer Engineering Option).

Second Year

Course	Credits		Term
CPSC 128	3	Principles of Computer Science	1
CPSC 216	3	Program Design and Data Structures	2
ELEC 251	3	Circuit Analysis I	1
ELEC 253	3	Circuit Analysis II	2
ELEC 254	3	Electronic Circuits I	1
ELEC 256	3	Digital Logic Design	2
ELEC 259	3	Introduction to Microcomputers	2
ELEC 280	2	Electrical Laboratory I	1
ELEC 281	2	Electrical Laboratory II	2
MATH 253	3	Multivariable Calculus	1
MATH 254	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
Plus	6	Complementary Studies Electives ¹ (2 credits in each term)	

Total 40

Third Year

Course	Credits		Term
APSC 201 ¹	3	Technical Communication	2
or			
ENGL 301 ¹	3	Practical Writing	2
CPSC 310	3	Software Engineering	1
Plus one of:			
CPSC 319	3	Software Engineering Project	Both
or			
ELEC 389	3	Software Engineering Project	2
ELEC 261	3	Engineering Electromagnetics	1
ELEC 315	3	Introduction to Operating Systems	1
ELEC 320	3	Introduction to Discrete Structures	1
ELEC 351	3	Physical Microelectronics	1
ELEC 356	3	Electronic Circuits II	2
ELEC 359	3	Signals and Communications	1
ELEC 360	3	Systems and Control	2
ELEC 364	4	Electromagnetic Fields and Waves	2
ELEC 382	4	Electrical Laboratory III A	2
MATH 257	3	Partial Differential Equations	1
STAT 251	3	Elementary Statistics	2

Total 44

¹ Credit will be given for only one of APSC 201 or ENGL 301.

Fourth Year

Course	Credits		Term
APSC 450	2	Professional Engineering Practice	1
ELEC 450	3	Economic Analysis of Engineering Projects	1
ELEC 456	3	Computer Communications	1
ELEC 464	3	Microprocessor Systems Design	1
ELEC 474	4	Instrumentation Design Laboratory	1
ELEC 475	4	Project Laboratory	2
ELEC 476	3	Computer Architecture	2
ELEC 498	2	Engineering Report	Both
Plus	15	Electives – at least 9 credits from list A below; remainder from list B	

Plus one of the following three:

CPSC 415	3	Advanced Operating Systems	2
CPSC 416	3	Distributed Systems	1
ELEC 494	3	Real-Time Digital System Design	2

Total 42

Fourth Year Computer Engineering Electives

The following are suggested elective courses. Other courses may be substituted with the approval of the Computer Engineering Undergraduate Coordinator.

List A

Course	Credits	
ELEC 455	6	Communication Systems
ELEC 466	3	Digital Signal Processing Systems
ELEC 468	3	Digital Process Control
ELEC 478	3	Computer Graphics
ELEC 479	3	Integrated Circuit Engineering
ELEC 480	3	Semi-Conductor Devices
ELEC 487	3	Introduction to Robotics
ELEC 494	3	Real-Time Digital System Design
CPSC 311	3	Definition of Programming Languages
CPSC 312	3	Symbolic Computing
CPSC 320	3	Analysis of Algorithms
CPSC 322	3	Introduction to Artificial Intelligence
CPSC 404	3	Introduction to Database Management Systems

CPSC 411	3	Introduction to Compiler Construction
CPSC 415	3	Advanced Operating Systems
CPSC 416	3	Distributed Systems
CPSC 418	3	Advanced Computer Architectures
CPSC 422	3	Intelligent Systems

List B

Course	
ELEC 4XX	Any 300-level course not in the core program
ELEC 4XX ¹	Any other 400-level ELEC courses
Other	Other courses from a list made available by the Department in March

¹ Credit is given for only one of ELEC 352 and ELEC 452.

Geological Engineering

Geological Engineering is an interdisciplinary program under the jurisdiction of the Dean of the Faculty of Applied Science and administered by a Board of Study.

Inquiries regarding the program and student advising should be made through Dr. A.J. Sinclair, Director, Geological Engineering, Room 102, Department of Geological Sciences, telephone (604) 822-3763.

Students take a common first year program. In second year, students can choose their programs from one of three options:

- Option 1 – Fuels and Minerals
- Option 2 – Applied Geophysics
- Option 3 – Environmental and Geotechnical

Students in Option 1 are given the choice of focusing on hydrocarbon exploration and production or mineral exploration and development. Option 2 is for those interested in the application of geophysics to mineral or petroleum exploration or to geotechnical and environmental engineering. Applications of mathematics and physics are emphasized in Option 2. Option 3 is a common choice for those interested in the application of geology to water resources, foundation engineering and construction or environmental problems.

Second Year

Course	Credits		Term
APSC 201	3	Technical Communication	
APSC 278	3	Engineering Materials	1
CIVL 235	4	Plane Surveying (End of 2nd Term, 1st Year)	
GEOL 150	3	Earth Science for Engineers	1
GEOL 200	3	Mineralogy I	1
GEOL 202	3	Introductory Petrology	2
GEOL 235	3	Field Techniques (Plus 1 week end of 2nd Term)	2
MATH 253	3	Multivariable Calculus	1
MATH 254	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
MATH 257	3	Partial Differential Equations	2
MECH 260	4	Introduction to Mechanics of Materials	1
PHYS 270	3	Mechanics II	2

Plus one of the following:

For Fuels and Minerals (Option 1)

GEOL 205	3	Geological Time	2
MMPE 290	4	Introduction to Mining and Mineral Processing	1

For Applied Geophysics (Option 2)

GEOL 256	3	Stratigraphy and Sedimentology	2
GEOP 232	3	Introduction to Experimental Geophysics	2

For Environmental and Geotechnical (Option 3)

GEOL 256	3	Stratigraphy and Sedimentology	2
SOIL 200	3	Introduction to the Study of Soils	2

Total
Option 1 48
Option 2 47
Option 3 47

* Please refer to the statement headed "Complementary Studies Courses" above.

¹ Chosen in consultation with Director.

Third Year Core

Course	Credits	Field	Term
GEOL 235	3	Field Techniques	2
GEOL 251	3	Geomorphology	1
GEOL 307	3	Structural Geology I	1
GEOL 345	3	Field School (At end of 3rd year)	
GEOL 342	3	Groundwater Hydrology	1
GEOL 407	3	Structural Geology II	2

Option 1 (Fuels and Minerals)

CIVL 210	3	Soil Mechanics I	1
GEOL 302	3	Principles of Igneous Processes	1
GEOL 303	3	Metamorphic Petrology	2
MMPE 303	2	Rock Properties	2
Plus	6	Complementary Studies Electives ¹ (3 credits in each term)	Both
Plus	6	Technical Electives (3 credits in each term)	Both

Plus one of:

GEOP 232	3	Introduction to Experimental Geophysics	2
SOIL 200	3	Introduction to the Study of Soils	2

Option 2 (Applied Geophysics)

GEOP 320	3	Introduction to Theoretical Geophysics	1
GEOP 321	3	Seismology	2
GEOP 322	3	Time Series Analysis in Geophysics	1
MATH 350	3	Complex Variables and Applications	2
PHYS 251	4	Electric and Magnetic Fields	1
Plus	3	Complementary Studies Electives ¹	2
Plus	3	Technical Electives	2

Plus one of:

GEOL 302	3	Principles of Igneous Processes	1
GEOL 303	3	Metamorphic Petrology	2

Option 3 (Environmental and Geotechnical)

CIVL 210	3	Soil Mechanics I	1
CIVL 215	3	Fluid Mechanics	1
CIVL 300	3	Engineering Economic Analysis	2
Plus	6	Complementary Studies Electives ¹ (3 credits in each term)	Both

Plus one of:

GEOL 302	3	Principles of Igneous Processes	1
GEOL 303	3	Metamorphic Petrology	2

Plus the following:

Environmental Option (3a)

GEOG 310	3	Environmental Resources	2
GEOL 323	3	Introductory Geochemistry	1
Plus	3	Technical electives	1

Geotechnical Option (3b)

MMPE 303	3	Rock Properties	2
Plus	6	Technical electives (3 credits in each term)	Both

Total

- Option 1 44**
- Option 2 43**
- Option 3 45**

Fourth Year Core

Course	Credits	Field	Term
APSC 450	2	Professional Engineering Practice ¹	1

One of:

GEOL 499	6	Thesis ²	Both
or			
GEOP 499	6	Thesis ²	Both

Option 1 (Fuels and Minerals)

GEOL 368	3	Introduction to Mineral Deposits and Exploration Geology	1
GEOL 425	3	Geological Evolution of North America	2
GEOL 416	3	Fossil Fuels	2
GEOP 300	3	Environmental, Geotechnical and Exploration Geophysics I	1
GEOP 301	3	Environmental Geotechnical and Exploration Geophysics II	2
MMPE 396	3	Engineering and Mineral Economics	2
MMPE 403	3	Rock Mechanics	1
Plus	6	Technical Electives (3 credits each term)	Both

Plus the following:

GEOL 421	3	Paleontology	2
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Minerals Option (1b)

GEOL 420	3	Advanced Mineral Deposits	1
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Option 2 (Applied Geophysics)

GEOP 420	3	Potential Methods	1
GEOP 421	6	Applied Geophysical Laboratory	Both
GEOP 426	3	Advanced Physics of the Earth	2
Plus	6	Technical Electives (3 credits in each term)	Both

Plus one of:

CIVL 300	3	Engineering Economic Analysis	1
MMPE 396	3	Engineering and Mineral Economics	2

Plus three of:

CIVL 210	3	Soil Mechanics I	1
GEOL 368	3	Introduction to Mineral Deposits and Exploration Geology	1
GEOL 416	3	Fossil Fuels	2
GEOL 462	3	Principles of Geological Engineering	1

Option 3 (Environmental and Geotechnical)

CIVL 300	3	Engineering Economic Analysis	1
CIVL 402	2	Engineering Law and Contracts ¹	2
CIVL 410	3	Foundation Engineering I	1
CIVL 411	3	Foundation Engineering II	2
GEOL 452	2	Geotechnical Engineering Practice	2
GEOL 462	3	Principles of Geological Engineering	1

Plus the following:

CIVL 405	3	Environmental Impact Studies	1
GEOL 412	3	Groundwater Contamination	2
GEOL 413	3	Groundwater Geochemistry	2
Plus	9	Technical Electives (6 credits in 1st Term, 3 credits in 2nd Term)	

Geotechnical Option (3b)

GEOP 300	3	Environmental, Geotechnical and Exploration Geophysics I	1
GEOP 301	3	Environmental, Geotechnical and Exploration Geophysics II	2
MMPE 403	3	Rock Mechanics	1
Plus	9	Technical Electives (3 credits in 1st Term, 6 credits in 2nd Term)	

Total

- Option 1 38**
- Option 2 41**
- Option 3 42**

¹ Students in Option 3 (Environmental and Geotechnical) take CIVL 402 instead of APSC 450 and add an additional two credits to their Technical Elective requirement.

² Options 1 and 3 take GEOL 499; Option 2 takes GEOP 499.

Mechanical Engineering

In addition to the regular Mechanical Engineering program, there are three options: Naval Architecture, Computer-Aided Automation, and Industrial Aerodynamics and Aircraft. A five-year combined B.A.Sc./M.Eng. is also offered in Electro-Mechanical Design Engineering.

Second Year

Course	Credits	Field	Term
APSC 201	3	Technical Communication	1
APSC 278	3	Engineering Materials	1
ELEC 263	3	Basic Circuit Analysis	2
MATH 255	3	Multivariable Calculus	1
MATH 251	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
MECH 250	1	Introduction to Engineering Software	1
MECH 251	1	Introduction to Design	2
MECH 260	4	Introduction to Mechanics of Materials	1
MECH 265	4	Rigid Body Dynamics	2
MECH 270	4	Thermodynamics	1
MECH 271	1	Thermodynamics Laboratory	2
MECH 280	1	Introduction to Fluid Mechanics	2
Plus	3	Complementary Studies Electives ¹	2
Total	43		

Third Year

Course	Credits	Field	Term
ELEC 365	3	Applied Electronics and Electromechanics	1
MATH 257	3	Partial Differential Equations	1
MECH 351	10	Engineering Product Design	Both
MECH 352	4	Design of Mechanical Components	2
MECH 360	4	Mechanics of Materials I	2
MECH 365	2	Machine Dynamics and Vibrations	1
MECH 370	3	Thermal Systems	2
MECH 375	3	Heat Transfer I	1
MECH 380	4	Fluid Dynamics	1
MECH 392	2	Manufacturing Processes	2
MMAT 380	3	Structures and Properties of Materials	2
Total	41		

Fourth Year

Students pre-register for fourth year courses with a Faculty Advisor towards the end of third year. Each student takes 27 credits as core in the fourth year, and chooses a minimum of 12 credits of Technical Electives and three credits of Complementary Studies electives.

Course	Credits	Field	Term
APSC 450	2	Professional Engineering Practice	1
ELEC 485	3	Digital Instrumentation for Mechanical Systems	1
MECH 430	3	Engineering Data Analysis	2
MECH 431	3	Engineering Economics	2
MECH 457	8	Mechanical Engineering Project	Both
MECH 465	1	Mechanical Vibrations	1
MECH 466	1	Automatic Control	1
Plus	12	Technical Electives	Both
Plus	3	Complementary Studies Electives ¹	2
Total	42		

The following are suggested technical elective courses. Note that some of these may not be offered in a given year. With the approval of the Department three credits of technical electives may be chosen outside the Department or from MECH graduate courses.

Fourth Year Electives

Course	Credits	Field
MATH 350	3	Complex Analysis and Applications
MMAT 494	2	Composite Materials I
CHML 471	2	Mechanical Pulping and Paperworking Technology
MECH 310	3	Statics of Marine Vehicles
MECH 341	3	Ship Resistance and Propulsion
MECH 405	3	Acoustics and Noise Control
MECH 410	2-6	Special Topics in Mechanical Engineering
MECH 441	3	Computer-Aided Ship Design
MECH 442	3	Ship Structures and Vibrations
MECH 443	3	Experimental Naval Architecture
MECH 453	2	Friction, Wear and Lubrication
MECH 454	2	Fluid Film Lubrication
MECH 460	3	Mechanics of Materials II
MECH 462	3	Finite Element Analysis
MECH 467	3	Advanced Dynamics
MECH 468	3	Modern Control Engineering
MECH 469	3	Dynamic System Modeling
MECH 470	2	Thermal Power Generation
MECH 473	2	Heating, Ventilating and Air Conditioning
MECH 475	2	Heat Transfer II
MECH 481	3	Aerodynamics of Aircraft I
MECH 482	3	Wind Engineering
MECH 483	3	Aerodynamics of Aircraft II
MECH 484	3	Aircraft Design: Aerodynamics
MECH 485	3	Aircraft Design: Structures
MECH 486	3	Fluid Flow in Industrial Equipment
MECH 490	3	Production Engineering
MECH 491	1	Computer-Aided Manufacturing
MECH 495	3	Industrial Engineering
MECH 496	3	Engineering Management

Naval Architecture Option

By taking the following modified program in third and fourth years, students can complete the requirements of the Naval Architecture Option in Mechanical Engineering. Students who satisfactorily complete this program

¹ Please refer to the statement headed "Complementary Studies Courses" above.

² Chosen in consultation with Director.

will be given recognition as receiving the B.A.Sc. in Mechanical Engineering (Naval Architecture Option). In this option, the third and fourth years are modified by deletion of the core course MECH 466 and all technical electives; moving ELEC 365 to fourth year (term one) and MECH 392 to fourth year (term two); and the addition of the Naval Architecture courses MECH 340, 341 (taken in third year) and MECH 441, 442, 443 (taken in fourth year).

Computer-Aided Automation Option

Admission into the Computer-Aided Automation Option is limited to students with high academic standing. Interested students are encouraged to apply to the Department. Students who satisfactorily complete this program will be given recognition as receiving the B.A.Sc. in Mechanical Engineering (Computer-Aided Automation Option).

In this option, the third and fourth years are modified by deletion of the core courses MECH 370, 371, 380, 457, and by the addition of the courses MECH 455, 456, 491 and ELEC 314, 315, 464, 468 and 478. Also, the requirement of 12 credits of technical electives in fourth year is replaced by one course of alternatives approved by the Director of the option.

Industrial Aerodynamics and Aircraft Option

Admission into the Industrial Aerodynamics and Aircraft Option is limited to students with high academic standing. Interested students are encouraged to apply to the Department. Students who satisfactorily complete the program will be given recognition as receiving the B.A.Sc. in Mechanical Engineering (Industrial Aerodynamics and Aircraft Option). In this option, the 12 credits of technical electives in fourth year must be selected from the following: MATH 350, MECH 453, 473, 481, 482, 483, 484, 485, 486, or from alternatives approved by the Director of the option.

B.A.Sc./M.Eng. in Electro-Mechanical Design Engineering

Admission into this combined undergraduate/graduate degree program is limited to a small number of students selected by interview during their second year of Mechanical Engineering studies. Courses completed in third, fourth and fifth years of study culminate in the award of two degrees simultaneously: the B.A.Sc. in Mechanical Engineering (Electro-Mechanical Design Option) and the M.Eng. A summer session is required between fourth and fifth years. Students must obtain Graduate Studies admission requirements in their third and fourth years (see Faculty of Graduate Studies section of *Calendar*). For further details, consult the Department of Mechanical Engineering and Faculty of Graduate Studies admission officers.

Third Year

Course	Credits	Term	
CPSC 118	3	Principles of Computer Programming	1
ELEC 251	3	Electronic Circuits I	1
ELEC 256	3	Digital Logic Design	1
ELEC 259	3	Introduction to Microcomputers	2
ELEC 283	2	Electro-Mechanical Laboratory I	2
ELEC 314	3	System Software Engineering	2
ELEC 356	3	Electronic Circuits II	2
MATH 257	3	Partial Differential Equations	1
MECH 351	10	Engineering Product Design	Both
MECH 360	4	Mechanics of Materials I	2
MECH 365	2	Machine Dynamics and Vibration	1
MECH 375	3	Heat Transfer I	1
MECH 392	2	Manufacturing Processes	2
Total	44		

Fourth Year

Course	Credits	Term	
APSC 450	2	Professional Engineering Practice	1
ELEC 315	3	Introduction to Operating Systems	1
ELEC 370	3	Electrical Machines and Power Transmission	2
ELEC 483	2	Electro-Mechanical Laboratory II	1
ELEC 464	3	Microprocessor Systems Design	1
ELEC 491	3	Real-Time Digital System Design	2
MECH 352	4	Design of Mechanical Components	2
MECH 430	3	Engineering Data Analysis	2
MECH 431	3	Industrial Systems	2
MECH 462	3	Finite Element Analysis	2
MECH 465	4	Mechanical Vibrations	1
MECH 466	4	Automatic Control	1
MECH 491	4	Computer-Aided Manufacturing	1
MMAT 380	3	Structure and Properties of Materials	2
Total	44		

Fifth Year (effective September 1996)

Course	Credits	Term	
MECH 549	0	Major Essay	2
MECH 551	8	Advanced Machine Design Project ¹	Both
MECH 552	6	Electro-Mechanical System Design Project ¹	Both
Plus	12	Technical Electives	Both
Plus	6	Complementary Studies Electives ²	Both
Total	32		

¹ Project work to be started at the end of fourth year.

Metals and Materials Engineering

Metals and Materials Engineering is concerned with the characterization, processing and use in design of metallic and non-metallic materials. An optional cooperative education program is available which permits students to obtain twenty months of related experience in the last three years of the program. Interested students should apply to Applied Science Cooperative Education, CEME 2205, during the first week of second year.

Second Year

Course	Credits	Term	
APSC 278	3	Engineering Materials	1
MATH 253	3	Multivariable Calculus	1
MATH 254	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
MATH 257	3	Partial Differential Equations	2
MECH 260	4	Introduction to Mechanics of Materials	1
MMAT 250	4	Metallurgical Thermodynamics I	1
MMAT 252	4	Pyrometallurgy I	2
MMAT 263	4	Transport Phenomena I	2
MMAT 280	3	Materials in Design	2
Plus	6	Complementary Studies Electives ² (3 credits in each term)	
Total	40		

Third Year

Course	Credits	Term	
APSC 201	3	Technical Communication	1
ELEC 263	3	Basic Circuit Analysis	1
MMAT 358	4	Hydrometallurgy I	2
MMAT 361	3	Application of Numerical Methods to Materials	2
MMAT 363	2	Transport Phenomena II	2
MMAT 365	3	Mechanical Behaviour of Materials	2
MMAT 376	4	Structure and Properties of Steel	1
MMAT 377	2	Engineering Alloys	2
MMAT 378	2	Phase Transformations	1
MMAT 382	4	Ceramics I	2
MMAT 390	1	Seminar I	Both
MMAT 391	2	Polymers	1
MMAT 398	1	Engineering Report	Both
MMAT 450	4	Metallurgical Thermodynamics II	1
MMAT 491	2	Composite Materials I	1
STAT 251	3	Elementary Statistics	2
Total	43		

Fourth Year Core

Course	Credits	Term	
APSC 450	2	Professional Engineering Practice	1
MMAT 450	4	Metallurgical Thermodynamics II	1
MMAT 456	2	Corrosion Engineering	1
MMAT 490	1	Seminar II	Both
MMAT 493	2	Quality Engineering	2
MMAT 495	3	Metallurgical Laboratory	2
MMAT 498	1	Engineering Report	Both
MMAT 499	3	Research or Design Project	Both
MMPE 396	3	Engineering Economics	1

Plus one of Option 1 or Option 2

Option 1 (Materials Processing)

CHML 356	3	Control of Process Variables	2
MMAT 452	2	Iron and Steelmaking	2
MMAT 458	2	Hydrometallurgy	2
MMAT 462	2	Process Modelling	1
MMAT 483	2	Processing of Ceramics and Composites	2

Option 2 (Materials Science and Engineering)

MMAT 479	2	Failure Analysis	2
MMAT 480	2	Fracture	2
MMAT 482	3	Ceramics II	1
MMAT 488	2	Strengthening in Alloy Systems	1
MMAT 494	2	Composite Materials I	1
Plus	12	Approved technical electives of which at least 6 credits must be selected from the other option and/or the following list of Metals and Materials Engineering electives:	

MMAT 454	2	Reactive Metal Processing	2
MMAT 472	3	Welding and Joining	2
MMAT 474	2	Mechanical Working	2
MMAT 478	2	Electronic Materials	1
MMAT 484	2	Refractory Practice and Problems in Metallurgical Industries	1
MMAT 486	2	Nondestructive Evaluation	1
MMAT 492	2	Powder Metallurgy	2
Total	44		

Mining and Mineral Process Engineering

Mining and Mineral Process Engineering is concerned with the optimal exploitation of mineral resources while minimizing environmental impact. The discipline requires a broad knowledge of engineering and scientific subjects. In Third year, students will select either the Mining Option or the Mineral Processing Option.

Second Year

Course	Credits	Term	
APSC 201	3	Technical Communication	2
CHML 251	3	Transport Phenomena I	2
CHML 345	2	Applied Thermodynamics I	1
CIVL 235	4	Plane Surveying (End of 2nd Term, 1st Year)	
GEOI 150	3	Earth Science for Engineers	1
GEOI 308	3	Introduction to Mineralogy and Petrology	1
MATH 253	3	Multivariable Calculus	1
MATH 255	3	Ordinary Differential Equations	1
MECH 260	4	Mechanics of Materials	1
MMPE 290	4	Introduction to Mining and Mineral Processing	1
MMPE 293	1	Seminar	Both
MMPE 295	3	Computer Applications in Mining and Mineral Processing	2
STAT 251	3	Elementary Statistics	2
Plus	3	Complementary Studies Electives ²	2
Total	42		

Third Year Core

Course	Credits	Term	
APSC 278	3	Engineering Materials	1
ELEC 263	3	Basic Circuit Analysis	1
ELEC 370	3	Electric Machines and Power Transmission	2
GEOI 368	3	Mineral Exploration and Mining Geology	1
MMPE 301	1	Mine Services	1
MMPE 303	3	Rock Properties	2
MMPE 304	2	Rock Fragmentation	1

² Please refer to the statement headed "Complementary Studies Courses" above.

³ Chosen in consultation with Director.

MMPE 351	1	Unit Operations	1
MMPE 353	1	Flotation	2
MMPE 393	1	Seminar	Both
MMPE 396	3	Engineering Economics	1
MMPE 397	3	Mineral Economics and Ore Reserve Estimation	2
MMPE 491	2	Mining and the Environment	2
Plus	3	Complementary Studies Electives ¹	1

Mining Option

GEOE 354	3	Structural Geology	2
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Mineral Processing Option

MMAT 351	3	Process Metallurgy	2
Total	44		

Fourth Year Core

Course	Credits		Term
APSC 450	2	Professional Engineering Practice	1
MMPE 401	3	Mine Design	1
MMPE 431	3	Plant Design	2
MMPE 491	2	Mining and the Environment	2
MMPE 492	1	Field Trip	1
MMPE 493	1	Seminar	Both
MMPE 494	6	Thesis/Report	Both
MMPE 495	3	Systems	2
MMPE 498	3	Materials Handling	1
Plus	3	Complementary Studies Electives ¹	2

Mining Option

MMPE 402	3	Mine Ventilation	1
MMPE 403	3	Rock Mechanics	1
Plus	10	Minimum of technical electives ¹	Either

Mineral Processing Option

MMPE 432	3	Control of Mineral Processes	1
MMPE 434	3	Processing Precious Metal Ores	2
MMPE 462	3	Coal Preparation Technology	1
Plus	7	Minimum of technical electives ¹	Either
Total	43		

¹ Technical elective courses are selected with the approval of the Department.

Engineering Physics

Engineering Physics is a program under the jurisdiction of the Dean of the Faculty of Applied Science and administered by the Department of Physics. All enquiries regarding the program and student advising should be made through Dr. E. G. Auld, Program Director, Engineering Physics, Hennings Building.

The completion of a B.A.Sc. degree in Engineering Physics will normally take five years of university study. There are two main routes to achieve this goal: the "Direct" and "Transfer" routes.

The "Direct" route is for students who enter first-year Applied Science directly from Grade 12. Having completed first-year Applied Science, the student must then complete four years in the Engineering Physics program as described below.

The "Transfer" route is for students who have completed first-year Science or the equivalent before entering the Faculty of Applied Science. To enter the Engineering Physics Program, students must apply when they apply to get into the Faculty of Applied Science. Normally these students will be deficient some of the courses offered in First Year Applied Science. The courses are listed below. Footnotes 1, 2, and 3 describe some of the choices that students may make, depending on their background. Students who are considering entering this Program via the "Transfer" route, are advised to consult with the Program Director concerning the transferability of course credits.

An optional co-operative education program is available for students in Engineering Physics. To be eligible, stu-

dents must be admitted into the second-year Engineering Physics program and have at least a 70% average. Interested students should apply at the beginning of the second year (by September 30) to: Co-operative Education Programs, Science/Engineering Physics, Room 309 Hennings Bldg., The University of British Columbia, 6224 Agricultural Road, Vancouver, B.C., V6T 1Z1.

Second Year

Course	Credits		Term
APSC 201	3	Technical Communication	2
APSC 278	3	Engineering Materials	1
CPSC 128	3	Principles of Computer Science ¹	Both
ELEC 251	3	Circuit Analysis I ²	1
ELEC 253	3	Circuit Analysis II ²	2
MATH 253	3	Multivariable Calculus	1
MATH 251	3	Vector Calculus	2
MATH 255	3	Ordinary Differential Equations	1
MECH 280	4	Introduction to Fluid Mechanics	2
PHYS 157	2	Heat and Thermodynamics	1
PHYS 159	1	Experimental Techniques	1
PHYS 250	4	Introduction to Modern Physics ³	2
PHYS 270	3	Mechanics II	2
Total²	38		

Third Year Core

Course	Credits		Term
ELEC 251	3	Circuit Analysis I ²	1
ELEC 253	3	Circuit Analysis II ²	2
ELEC 254	3	Electronic Circuits I	2
MATH 257	3	Partial Differential Equations (Opt 1: 1st term, Opt. 2: 2nd term)	1
MATH 307	3	Linear Algebra	1
PHYS 250	4	Introduction to Modern Physics ³	2
PHYS 251	1	Introduction to Electricity and Magnetism	1
PHYS 351	3	Applied Electromagnetic Theory	2
PHYS 352	2	Laboratory Techniques in Physics	2
STAT 251	3	Elementary Statistics	2
Plus	3	Complementary Studies Electives ¹	Either

Choose one of the following Options⁴:

Option 1

CPSC 216	3	Program Design and Data Structures	2
ELEC 256	3	Digital Logic Design	1
ELEC 259	3	Digital Systems	2
ELEC 281	2	Electrical Engineering Laboratory II	2

Option 2

MECH 260	4	Introduction to Mechanics of Materials	1
MECH 352	4	Introduction to Design	2
MMAT 280	3	Materials in Design	2
Total²	35		

¹ It is recommended that students who have completed first-year Applied Science, or have completed MATH 152 or its equivalent, take ELEC 251 and ELEC 253 in second year.

² The course load total is based on the assumption that students have completed all of the first-year Applied Science requirements, and are choosing the option of taking ELEC 251, 253 and PHYS 250 in second year.

³ Normally students completing first-year Science will have the following course deficiencies: APSC 124, APSC 151, CPSC 152, MATH 152, and PHYS 170. They should take these courses in second year and defer the following courses to third year: ELEC 251, ELEC 253, and PHYS 250. If students have not taken CPSC in first-year Science, they should plan on taking CPSC 124 and CPSC 126 in second year.

⁴ Students interested in the Electrical, Computer Science, or Geophysics options in fourth and fifth year should take Option 1 in third year. Students interested in the Mechanical, or Metals and Materials options in fourth and fifth year should take Option 2 in third year. Students interested in the Oceanography option in fourth and fifth year can take either Option 1 or 2 in third year.

Fourth Year Core

Course	Credits		Term
APSC 459	5	Engineering Physics Project I	Both
MATH 300	3	Introduction to Complex Variables	1
MATH 301	3	Applied Analysis	2
PHYS 398	2	Technical Report ¹	1
PHYS 452	3	Quantum Mechanics	2
PHYS 456	3	Applied Classical Mechanics	1
Plus	3	Complementary Studies Electives ¹	Either

¹ Credit will be given for one of APSC 201 or PHYS 398. 1995/96 will be the last year that PHYS 398 will be offered.

Choose one of the following options:

Option 1 (ELEC)

ELEC 351	3	Physical Micro-Electronics	1
ELEC 356	3	Electronic Circuits II	1
ELEC 359	3	Signals and Communications	1
ELEC 360	3	Systems and Control	2
Plus	6	Minimum of technical electives normally relevant to Electrical Engineering ^{1b}	Either

¹ Consider the electives you want for both the fourth and fifth year to ensure that the required prerequisites have been taken. The technical elective courses should be chosen to ensure a consistent package of courses in one subdiscipline of Electrical Engineering.

Option 2 (MECH)

APSC 380	3	Introduction to Microcomputers	2
MECH 351	10	Engineering Prod. Design	Both
MECH 365	2	Machine Dynamics and Vibrations	1
MECH 370	3	Thermal Systems	2
Plus	3	Minimum of technical electives normally relevant to Mechanical Engineering ^{1b}	Either

¹ Consider the electives you want for both the fourth and fifth year to ensure that the required prerequisites have been taken. The technical elective courses should be chosen to ensure a consistent package of courses in one subdiscipline of Mechanical Engineering.

Option 3 (MMAT)

APSC 380	3	Introduction to Microcomputers	2
MECH 375	3	Heat Transfer I	1
MMAT 365	3	Mechanical Behaviour of Materials	2
MMAT 376	3	Structure and Properties of Steel	1
MMAT 377	2	Engineering Alloys	2
MMAT 378	3	Phase Transformations	1
Plus	3	Minimum of technical electives normally relevant to Metals and Materials Engineering ^{1b}	Either

¹ Consider the electives you want for both the fourth and fifth year to ensure that the required prerequisites have been taken. The technical elective courses should be chosen to ensure a consistent package of courses in one subdiscipline of Metals and Materials Engineering.

Option 4 (GEOP)

APSC 380	3	Introduction to Microcomputers	2
GEOP 320	3	Introduction to Theoretical Geophysics	1
GEOP 321	3	Seismology	2
GEOP 322	3	Analysis of Geophysical Time Series	1
Plus	8	Minimum of technical electives, 6 of which should be from Computer Science or an Engineering discipline related to Geophysics ¹	Either

Option 5 (CPSC)

CPSC 220	3	Introduction to Discrete Structures	1
CPSC 310	3	Software Engineering	1
CPSC 315	3	Introduction to Operating Systems	2
CPSC 318	3	Machine Structures	2
Plus	6	Minimum of technical electives ¹	Either

¹ Consider the electives you want for both the fourth and fifth year to ensure that the required prerequisites have been taken. The technical elective courses should be chosen to ensure a consistent package of courses in one subdiscipline of Electrical Engineering.

Option 6 (OCGY)

APSC 380	3	Introduction to Microcomputers	2
MECH 380	1	Fluid Dynamics	2
OCGY 308	3	Introduction to Oceanography I	1
OCGY 309	3	Introduction to Oceanography II	2
OCGY 408	3	Oceanographic Methods	1
Plus	4	Minimum of technical electives from an Engineering discipline ²	Either

Total Core 22

- Plus**
- Option 1 18**
- Option 2 21**
- Option 3 20**
- Option 4 18**
- Option 5 20**
- Option 6 20**

¹ Please refer to the statement headed "Complementary Studies Courses" above.

² Chosen in consultation with Director.

Fifth Year Core

Course	Credits		Term
APSC 450	2	Professional Engineering Practice	1
APSC 479	4	Engineering Physics Projects II	1
MATH 400	3	Applied Partial Differential Equations	Either
Plus	3	Free Electives ¹	2
Plus three of:			
PHYS 456	3	Applied Classical Mechanics	1
PHYS 458	4	Applied Optics	Both
PHYS 473	3	Applied Nuclear Physics	1
PHYS 474	3	Applied Solid State Physics	2
PHYS 477	3	Applied Plasma Physics	2

Note: This is the last year in which fifth year students must choose three of five of the senior Physics courses. PHYS 456 is a core requirement for fourth year as of 1995/96 and PHYS 458 will be a core requirement for fifth year as of 1996/97. Students will then be expected to complete one of the remaining elective Physics courses.

Plus one of the following options:**Option 1 (ELEC)**

ELEC 450	3	Economic Analysis of Engineering Projects	1
ELEC 455	6	Communication Systems	Both
ELEC 460	3	Control Systems	1
Plus	6	Minimum of technical electives relevant to Electrical Engineering ^b	Either

Option 2 (MECH)

MECH 370	3	Thermal Systems	2
MECH 431	3	Engineering Economics	2
MECH 465	4	Mechanical Vibrations	1
MECH 466	4	Automatic Control	1
Plus	3	Minimum of technical electives normally relevant to Mechanical Engineering ^b	Either

Option 3 (MMAT)

MMPE 396	3	Engineering Economics	1
MMAT 495	3	Metallurgical Laboratory	2
Plus	12	Minimum of technical electives, of which not less than 9 credits must be chosen from the MMAT courses. The remaining three credits can be courses relevant to Metals and Materials Engineering ^b	Either

Option 4 (GEOP)

ELEC 450	3	Economic Analysis of Engineering Projects	1
GEOP 420	3	Potential Methods	1
GEOP 421	6	Applied Geophysical Laboratory	Both
GEOP 426	3	Advanced Physics of the Earth ¹	2
Plus	6	Minimum of technical electives ¹ , from an Engineering discipline and 3 from a related discipline ^b	Either

Option 5 (CPSC)

ELEC 450	3	Economic Analysis of Engineering Projects ¹	1
Plus	9	CPSC courses chosen in consultation with the Director of Engineering Physics, and the CPSC member of the Board of Studies of Engineering Physics.	
Plus	6	Minimum of technical electives from a relevant Engineering discipline ^b	Either

Option 6 (OCGY)

ELEC 450	3	Economic Analysis of Engineering Projects	1
OCGY 414	3	Geophysical Fluid Dynamics	2
OCGY 419	6	Oceanographic Research	Both
Plus	6	Minimum of technical electives, at least 3 credits of which must be from an Engineering discipline ^b	Either

Total Core 21 or 22

Plus

Option 1 18

Option 2 17

Option 3 18

Option 4 18

Option 5 18

Option 6 18

¹ Students in Option 4 should take GEOP 426 in place of the free elective.

^a Please refer to the statement headed "Complementary Studies Courses" above

The Centre for Metallurgical Process Engineering

Director: J. K. Brimacombe, Alcan Chair in Materials Process Engineering.

The Centre for Metallurgical Process Engineering has been established to facilitate and foster research and graduate training related to metals and materials processes. The Centre encompasses processes in both the ferrous and non-ferrous industries from raw materials preparation to metal finishing. Processes for the production of other materials such as ceramics, electronic materials and composites are receiving increasing attention. Emphasis is placed on interdisciplinary studies which reflect the complexity of overall process routes and individual unit operations. The Centre actively promotes closer links with the metals and materials industry together with the involvement and support by industry of programs within the Centre.

The Centre has a Board of Management comprising the Dean of Applied Science (Chair), the Dean of Graduate Studies and the Head of the Department of Metals and Materials Engineering.

A Technical Advisory Council with representatives from industry, government and the University has been formed to make recommendations concerning research projects and graduate programs.

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Office of the Dean

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^b Chosen in consultation with Director.

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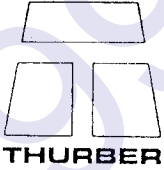

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Introduction

Architecture is one of several professions concerned with the human environment: the architect is educated to understand and participate in the design of the built environment. As an academic discipline, architecture relates the humanities, sciences, technology and the creative arts. Creating architecture demands a sound academic background and an ability in the realm of creative problem solving. It is essential therefore that all students entering the School of Architecture be academically mature and that they possess an imaginative outlook. The School thus selects students from a variety of disciplines on which to build architectural understanding and competence.

The tasks undertaken by the architect today embrace areas not previously of professional concern. As part of their work of design, architects now assist in the preparation of feasibility studies, programming for building, urban design, the development of building systems and the analysis of the building needs of the community. They are also called on to predict the efficiency and performance of materials used in building and are expected to know the effect of their buildings on people and social customs. These demands call into being new areas of research in which the physical, social and behavioural sciences and the humanities are involved. The School thus brings together in its faculty not only architects, but building scientists, engineers, historians and others offering courses in architecture and related disciplines.

The Master of Architecture (M.Arch.) program is a new program which replaces the old Bachelor of Architecture (B.Arch.) program. The School of Architecture also offers a post-professional Master of Advanced Studies in Architecture (M.A.S.A.) degree program.

**Bachelor of Architecture
B.Arch.**

Although the B.Arch. program will continue until September 1, 1999, only individuals previously admitted under the B.Arch. program are eligible. These individuals have until September 1, 1999 to complete degree requirements.

Individuals interested in beginning a professional degree program in the field of architecture should refer to the entry under "Master of Architecture".

The B.Arch. degree is a recognized professional degree designed to meet the requirements for entrance to the profession of architecture. The School also offers a post-professional graduate degree, Master of Advanced Studies in Architecture, for those persons interested in pursuing research or advanced studies in an area of specialization within the field of architecture.

The Bachelor of Architecture degree program is of three years' duration for students in full-time attendance during Winter Session; students studying on a part-time basis will need more than three years to fulfil degree requirements. Students may be advised to interrupt their academic studies at the end of first or second year for a prescribed period in order to experience conditions in practice, or take part in construction work, or to travel in countries outside Canada.

When appropriate arrangements can be made, the School will offer a Study Abroad program whereby approximately 20 second- or third-year students will travel to a selected location and, under the direction of faculty from this School and the host country, will undertake a full term's work, including design tutorials, lectures, and field trips.

**The School of
Architecture**

A School within the Faculty of Applied Science.

The School of Architecture offers the following degrees:

- Bachelor of Architecture (B.Arch.) – a three year professional program requiring a first degree for admission (to be phased out by 1999, no new students accepted).
- Master of Architecture (M.Arch.) – a three to three and one-half year professional graduate program replacing the B.Arch. degree effective September 1993.
- Master of Advanced Studies in Architecture (M.A.S.A.) – a post-professional graduate program.

These programs require planning well in advance of the leaving date, and every effort is made to give the students adequate lead time to make their own arrangements. Students interested in participating in this unique program must be prepared to meet the considerable extra expenses involved.

For information on the Master of Advanced Studies in Architecture degree program at The University of British Columbia, please refer to the Faculty of Graduate Studies section of the *Calendar*.

Re-admission

Students previously registered in the School of Architecture who were not registered in the immediately preceding winter session must make application for readmission through the Registrar's Office not later than June 15 or by December 1 for the second term.

Students registering in the School of Architecture after a period of absence are subject to the regulations and degree requirements in effect at the time of re-registering. Any deviation from these regulations and requirements must be approved by the Director.

Program of Study

Instruction in the School is offered through several types of courses:

- 1) The Introductory Workshop, mandatory for all new students entering the program, for a period of approximately two weeks prior to Labour Day, involves the study of selected environments in the form of an extended field trip.
- 2) Lecture Courses and Seminars
- 3) Design Tutorials based on individual instruction using the project method. The student develops designs and communicates ideas through drawing for projects which may be hypothetical, or proposals for actual projects and sites. Students are expected to present and defend their proposals in the course of critical dialogue with faculty, visiting professionals, and their peers during reviews.

To qualify for the degree of Bachelor of Architecture a student must complete satisfactorily a minimum of 110 credits of course work selected on the basis of the following program of study:

Three Required Workshop Courses

Course	Credits	
ARCH 406	2	Introductory Workshop
ARCH 411	0	Computer Workshop
ARCH 412	2	Techniques Workshop
Total	4	

Thirteen Required Lecture/Seminar Courses and Graduation Report Preparation

Course	Credits	
ARCH 404	3	Architectural History ¹
ARCH 405	3	Architectural History ¹
ARCH 409	3	Introduction to the Behavioural Basis of Design ¹
ARCH 413	3	Introduction to Issues and Ideas in Architecture
ARCH 416	3	Architectural Structures 1 ¹
ARCH 422	1	Project Costing
ARCH 423	3	Process and Practice of Architecture 1 ¹
ARCH 426	3	Architectural Technology 1 ¹
ARCH 427	3	Architectural Technology 2
ARCH 436	3	Architectural Structures 2
ARCH 452	3	Environmental Systems and Controls 1 ¹
ARCH 454	3	Environmental Systems and Controls 2
ARCH 498	3	Graduation Project, Report Preparation

A history/theory offering²:

ARCH 445	3	Current Theories of Architecture
Total	40	

¹ These courses are a prerequisite to more advanced level courses and should therefore be completed in the first and second year of the program. ARCH 412, 413, and 426 are taken concurrently with ARCH 400 design tutorial.

² Other history/theory offerings will be available for credit. A published list will be available from the School.

Six Design Courses

Course	Credits	
ARCH 400	9	Architectural Design 1A
ARCH 401	9	Architectural Design 1B
ARCH 420	9	Architectural Design 2A
ARCH 421	9	Architectural Design 2B
ARCH 440	9	Architectural Design 3A
ARCH 499	9	Graduation Project: Part 2
Total	54	

Four Elective Courses normally selected from the following list:

Course	Credits	
ARCH 407	3	Research Methods in Architectural Evaluation
ARCH 408	3	Social Aspects of Architectural Space
ARCH 410	3	Architectural Graphics
ARCH 417	3	Computer Applications 1
ARCH 419	3	Computer Applications 2
ARCH 424	3	History of Urban Form

ARCH 425	3	History of Urban Planning: Workshop
ARCH 430	3	Architectural Acoustics
ARCH 431	3	Light, Colour, and Space
ARCH 442	3	Housing and Community
ARCH 445	3	Current Theories of Architecture
ARCH 446	3	Contemporary Issues in Architecture
ARCH 447	3	Urban Design Workshop
ARCH 448	3	History of Theories of Architecture
ARCH 450	3	Design Management
ARCH 451	3	Process and Practice of Architecture 2
ARCH 455	3	Energy and Building Design
ARCH 456	3	Structures: Special Topics
ARCH 458	3	Architecture Seminar
ARCH 459	3	Directed Studies
ARCH 471	3	Meaning in Architecture
ARCH 472	3	Meaning and Behaviour in the Landscape
ARCH 474	3	Introduction to Facilities Planning
ARCH 485	3	Special Topics in Architectural Technology

Total 12
Program Total 110

Note: A student who enrolls in the Study Abroad Program in a year may substitute ARCH 461 (Study of Architecture Abroad) for nine credits of electives and ARCH 460 (Design Abroad) for one of the nine-credit tutorial courses in ARCH 420, 421 or 440, so as to make up a full term's work abroad.

A student who has valid credit for a course similar to a required lecture course in this program may with faculty approval take an extra elective course in lieu of that required course, but still must complete a total of 110 credits in this program.

In addition, with the approval of a designated faculty adviser, a student may substitute a course or courses offered by another Department for not more than two electives, providing the course(s) can be shown to be relevant to the program.

Course descriptions are to be found in the alphabetical listings of the Departmental offerings in the *Calendar*. See the School Handbook for more complete details, including term, time, and location of courses.

Standing and Promotion

A student must:

- 1) Attain a mark of at least 65% in ARCH 400, ARCH 440, and ARCH 499, and at least 50% in all other tutorials and courses.
- 2) Attain an average mark of at least 65% over each term's work. This applies to courses taken in all terms and sessions.
- 3) On completion of ARCH 421, submit a portfolio including work from ARCH 400, ARCH 401, ARCH 420, and ARCH 421 (ARCH 460 if applicable) for review by the faculty.

Should a student not attain a 65% mark in ARCH 400, the following conditions would apply:

- 1) If the mark is less than 50% the student is then required to withdraw from the program for eight months and retake ARCH 400 in a subsequent Fall Term.
- 2) If the mark is between 50% and 65% then the student will not be given credit for ARCH 400. The student will be required to re-register for ARCH 400 in the following term.

Should a student not attain a 65% mark in ARCH 440, the student must then repeat the tutorial.

Should a student not attain an average of 65% for a term's work the student will lose credit for those courses in which a grade of less than 65% was achieved. Under special circumstances students will be granted the opportunity to undertake supplementary work in a course to raise their average to 65%.

Failure to attain any of the above requirements after two consecutive attempts will require that the student withdraw from the program for 12 months.

Failure to attain any of the above requirements in a total of three attempts will require a student to withdraw from the School, and the student will not be allowed to re-register in the program.

Faculty approval is required, based on a portfolio including work from ARCH 400, 401, 420, and 421 submitted on completion of ARCH 421, before a student may register in ARCH 440. If this approval is not given, the student will be required to re-register in ARCH 421.

The criteria to be used in determining faculty approval will be: overall academic standing in design, design ability in a broad range of design topics and demonstration of a "state of readiness" to proceed with the Graduation Project. Those students who have not maintained an average grade for ARCH 400, ARCH 401, ARCH 420, and ARCH 421 of 65% may be required to repeat ARCH 421. Other students may be advised to repeat ARCH 421.

Graduation Project

Special requirements and conditions apply to the Graduation Project, which includes both ARCH 498 and ARCH 499.

Part 1 (ARCH 498): Research, Preparation and Definition of the Graduation Project

In order to enrol in ARCH 498, a student must have successfully completed all requirements for second year. Each student undertaking ARCH 498 will attain agreement from a member of available faculty (a published list will be available from the School) to act as Mentor for the project. The Mentor must approve the topic and agree on the approach. A Statement of Intent, approved by the Mentor, must be submitted by the end of the first week of term. A Proposal for a specific project, approved by the Mentor, must be submitted by the end of the seventh week of term. The ARCH 498 Report is due on the last day of course work for the term.

The ARCH 498 Report must be completed in one term and a grade assigned prior to the marks meeting of that term. Should the work be incomplete a fail grade will automatically be assigned. The student may then re-register for ARCH 498 in the following term.

If the ARCH 498 Report is not completed and graded with a satisfactory standing at the end of the term in which it was started, the student may not proceed with ARCH 499 in the following term. Failure to complete ARCH 498 after two attempts will require that the student withdraw from the program for 12 months.

Part 2 (ARCH 499): Design and Presentation of the Graduation Project

No student will be permitted to proceed with ARCH 499 until the student has passed ARCH 498 and reduced any outstanding course requirements to a maximum of 18 credits.

Each student enrolled in ARCH 499 shall work under the supervision of a Committee, the Chair of which will normally be the Mentor from ARCH 498, or else a member of the faculty chosen from the published list. The student, with the approval of the Chair, will select two additional members for the Committee who may be from the School faculty or the community at large. Under the direction of

the Chair, the student will call a minimum of four meetings of the Committee at appropriate stages of the project to review progress. At the First Meeting of the Committee, the terms of reference for the project and the expectations of the Committee will be defined. At the Term-End Meeting, to be held by the last day of course work for the term, the Committee will determine whether the project is substantially complete, and is to be prepared for presentation.

At the Term-End Meeting the following conditions apply: students whose work is judged to be substantially complete and of acceptable quality will be required to make a public presentation of their work at the Final Review on a date scheduled by the School. Work that is not of an acceptable standard will be assigned a fail grade. Should the Committee decide that the project is not substantially complete it may either assign a fail grade or, alternatively, it may give the student permission to work on the project for one additional term. If the student wishes this extension, he must make a presentation to the Committee and an assigned group of faculty and request an extension. At this time the Committee may, only with the agreement of the assigned faculty, allow the student to continue work on the project. The student must complete the project by the end of that term or else a fail grade will be assigned.

All students eligible to do so must exhibit their projects at the Preview Exhibition scheduled just prior to Final Review. Students whose substantially complete projects are considered by their Committee to be inadequately presented may not be allowed to proceed to Final Review, and will be required to upgrade the presentation for the next Preview Exhibition.

At the Final Review, the grade for ARCH 499 will be established by the Committee in consultation with the assigned group of faculty and guest critic, immediately following the public presentation. In order to obtain credit for the course, the student must attain a mark of not less than 65%.

To complete the requirements for graduation, the work in the courses, ARCH 498 and 499, including reductions of all presentation drawings, must be summarized and compiled in a single Report on the Graduation Project. One copy of the approved Report, signed by the Chair of the student's Committee, must be submitted to the School of Architecture Reading Room for permanent record. Failure to submit an approved report by the specified date will prevent the student from graduating at the subsequent convocation.

If a fail grade or no credit is assigned for ARCH 499, the student will be required to withdraw from the School for a minimum period of twelve months. The student may then re-register for ARCH 499 and begin again with a new topic, Mentor, and Committee. It will be necessary for the student to undertake preparatory work acceptable to the new Committee Chair without credit, prior to re-registering.

Failure to attain the necessary requirements after repeating ARCH 499 will require the student to withdraw from the School, and the student will not be allowed to re-register in the program.

Should the program not be completed in six calendar years from the date of first registering in the School, the student must appeal for permission to re-enrol. Such an appeal will be granted only after it has been reviewed by the Director of the School of Architecture.

Honours Standing

At graduation, successful candidates will be graded as follows: First Class, an average of 80% or over; Second

Class, 65% to 79%. 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%.

Portfolio

All students are required to keep a portfolio of their work in each tutorial for review by faculty at the end of each term in which the tutorial is held.

The portfolio must contain, at a minimum, all the presentation drawings from each project in a tutorial, but these may be reproductions of originals.

The portfolio is to be kept available for review in case of an appeal of grade in the tutorials or other dispute regarding the student's standing.

Advanced Standing

Depending on previous experience and success in both studio and course work, in certain circumstances students may be given advanced standing in the program. This will be on a course for course basis and normally only granted when valid University level credit has been obtained at another institution in the subject area concerned and the School is satisfied that the work is equivalent.

Advanced standing will not be considered until the student has successfully completed one year in the program, and only then on the recommendation of the student's adviser and current tutorial Chair.

External Courses

Students may undertake courses outside the School of Architecture for credit toward their degree. Such courses must be demonstrated to be relevant to the student's program of study. Students must submit the request for permission to apply the course towards their degree, in writing, to the Standing and Promotions Committee. Credit will be granted on presenting a valid transcript from the institution concerned.

Except for special circumstances, the limit on external courses is six credits.

Supplementary Work

No supplementary work is available in tutorials.

For courses other than tutorials, the normal university regulations apply. Only in exceptional circumstances will a student be allowed to undertake supplementary work in those other Architecture courses which are assessed on a continuing basis throughout the term.

Evaluations and Appeals

In the event that a student disagrees with the evaluation for a particular course, the student should first consult the instructor of the course and then, if necessary, seek the advice of the Chair of the Standings and Promotions Committee. If a re-read of a course examination is requested, the student should follow the normal university procedure.

In the event that a student disagrees with the evaluation in a design tutorial, a student should:

- 1) Consult the design tutor(s) involved, and then, if still not satisfied, formally request in writing to the Director that an Appeal Committee be established to hear the case. This request will only be granted if it occurs within one week from the time marks are available on TELEREG and will not be granted if, in the interim, the student has enrolled in and completed an additional tutorial. The tutorial Appeals Committee will consist of three of the full-time design tutors plus the Direc-

tor, ex-officio, and it will have the authority to interview all persons involved and to recommend to the Director that the grade be affirmed or changed. The decision of the Director shall be final with respect to the academic aspect of the appeal.

- 2) If the student is not satisfied with respect to procedure or feels unjustly dealt with, the student can appeal further through the Registrar to the Senate Committee on Appeals on Academic Standing.

Practical Experience

In the summer months students are encouraged to gain practical experience in areas closely related to their interests in the School. Travelling is encouraged, or work in an architect's, engineer's, landscape architect's or planner's office. Alternatively, research is suggested at a university or with a public or private organization. Experience in the field of construction is also recommended. The School will advise the student whenever possible.

Professional Registration

The practice of architecture in Canada is governed by legislation enacted by the Provinces. The Architectural Profession Act in British Columbia, prescribes the qualifications for membership including academic and experience requirements. Legal protection of the title "Architect" is contained in the Architectural Profession Act.

The architectural profession has undergone significant changes in both structure and operation particularly with respect to the objectives, standards, and procedures affecting admission to the profession. The first of these developments relates to academic qualifications. The Provincial Associations (except Quebec) have established the Canadian Architectural Certification Board which administers a national program of academic certification and which has been adopted as a pre-requisite to registration in each of the Provinces.

The Architectural Act in B.C. requires a minimum of three years of experience in the employ of an architect subsequent to certification. During this "internship" period, candidates are required to enrol in the Architect-In-Training Program administered by the Examining Board of the A.I.B.C.

Passing the prescribed Registration Examinations comprises the final stage of the registration process.

Students are encouraged to make contact with the profession by applying for admission as "Student Associate Members" in both the Provincial Association and in the Royal Architectural Institute of Canada. Interested students should contact the offices of the Architectural Institute of British Columbia at 103-131 Water Street, Vancouver, B.C., V6B 4M3 to obtain full particulars concerning student memberships in the A.I.B.C. as well as the academic and other requirements governing admission to the profession in British Columbia.

Anticipated Expenses Involved

Apart from the cost of living and tuition, certain additional expenses must be anticipated to cover books, equipment, printing costs and ARCH 406, Introductory Workshop.

Students electing to participate in the Study Abroad program must be prepared to meet further expenses.

Master of Architecture M.Arch.

Effective September 1, 1993.

The Master of Architecture degree program is of three to three and one-half years' duration for students in full-time attendance during the Winter Session; students studying on a part-time basis will need more than three years to fulfill degree requirements. Students may be advised to interrupt their academic studies at the end of the first or second year and withdraw for a prescribed period in order to experience conditions in practice or to travel in countries outside Canada.

When appropriate arrangements can be made, the School will offer a Study Abroad program whereby approximately 20 students from the second and third years will travel to a selected location and, under the direction of faculty from this School and the host country, undertake a full term's work, including design tutorials, lectures, and field trips. These programs require planning well in advance of the departure date; every effort is made to give the students adequate lead time to make their own arrangements. Students interested in participating in this unique program must be prepared to meet the considerable extra expenses involved.

Admission

Students entering the program should demonstrate interest and potential in the broad field of the creative arts and architecture. Prior instruction and experience in the arts, crafts, or other design oriented activities, with emphasis on visual communication in various media, is extremely valuable. Similarly the selection of university courses covering a broad range of studies in the arts, humanities and social sciences on the one hand and the physical and applied sciences on the other, offers a desirable breadth and mix of academic experience. Irrespective of specific degree requirements within various faculties or universities, the School of Architecture considers it desirable that entering students have completed university-level course-work in mathematics, physics, English literature and composition, and a survey course in architectural history.

For students seeking general information and guidance in preparation for entry to the School, a brochure entitled Information for Prospective Students is available from the School on request.

Candidates for admission will be of two types: (1) those holding a Bachelor's degree from a recognized university who have achieved First Class standing (80% and above) in at least 12 credits of course work and at least an upper second class standing (74% to 79%) in the remainder of the course work in the last two years of undergraduate study, or their equivalent in the case of a student completing the undergraduate program on a part-time basis; (2) in special circumstances, designers who demonstrate advanced artistic achievement and would benefit from the program. Applicants must demonstrate aptitude for the study of architecture and creative potential. Applicants must submit all of the following by February 15 (except as specified in point 2 below):

- 1) Two application forms - (a) 'Application for Admission to the School of Architecture' and (b) 'Application for Admission to Graduate Studies.'
- 2) Two official transcripts of all post-secondary study completed to date, including mid-year (December) grades, should accompany the application or be forwarded to the School no later than February 15. An evaluation will be made on the basis of these tran-

scripts and a letter of conditional acceptance may then be issued. To satisfy the conditions of acceptance, two official transcripts confirming that the degree has been awarded must then be received by the School no later than October 31.

- 3) A brief biographical summary, including chronology and description of education, travel and work experience.
- 4) A portfolio containing evidence of creative work consisting of original sketches, drawings, paintings, sculpture, crafts, photography or other similar work. Additional information and instructions pertaining to the presentation of this portfolio is given in the 'Information for Prospective Students' brochure issued by the School.
- 5) A Statement of Interest outlining the reasons for wishing to study architecture and why the applicant has chosen the School of Architecture at The University of British Columbia.
- 6) Three confidential letters of reference from persons familiar with the applicants experience, interests and abilities relevant to the study of architecture. These must be sent directly to the School of Architecture by the writers.

Some applicants who meet entrance requirements may not be offered a place in the School because of limitations in the number of available places. All admissions must be approved by the Faculty of Graduate Studies.

All applicants to the School should note that a workshop course is mandatory for entering students. This workshop course is an integral part of the design program in first year. It is normally of two weeks duration and commences about mid-August. Dates and other particulars concerning the workshop course are normally provided with the letter of acceptance. Students who are unable to attend the complete workshop course or who fail to remit the course fee by the prescribed time will have their admission cancelled. A workshop fee of \$450 is payable within two weeks of the date of an applicants's acceptance of admission. After this time, no refund is possible.

Students accepted for admission to the School who subsequently find that they are unable to attend must re-apply for admission at a later date. A student whose application is rejected may seek the advice of the School before submitting a new application. The advice may include pursuit of academic studies or of specific kinds of experience.

Re-Instatement

Students in good standing who interrupt their studies by not registering in one or more Winter Sessions must make application through the School Office not later than March 31 (April 30 for students from Canada and the U.S.) for September re-instatement or by October 1 (November 1 for Canadian and U.S. students for January re-instatement. All re-instatements must be approved by the Dean of the Faculty of Graduate Studies. Students are subject to the time limits of Master's programs detailed in the Graduate Studies section of the *Calendar*.

Students registering in the School of Architecture after a period of absence are subject to the regulations and degree requirements in effect at the time of re-registering. Any deviation from these regulations and requirements must be approved by the Director.

Program of Study

Instruction in the School is offered through several types of courses:

- 1) The Introductory Workshop, mandatory for all new students entering the program, for a period of about two weeks prior to Labour Day; involves the study of selected environments in the form of an extended field trip.
- 2) Lecture Courses and Seminars
- 3) Design Tutorials based on individual instruction using the project method. The student develops designs and communicates ideas through drawing for projects which may be hypothetical, or proposals for actual projects and sites. Students are expected to present and defend their proposals in the course of critical dialogue with faculty, visiting professionals and their peers during reviews.

To qualify for the degree of Master of Architecture an incoming student must complete satisfactorily a minimum of 119 credits of course work selected on the basis of the following program of study:

Two Required Workshop Courses

Course	Credits	
ARCH 502	2	Introductory Workshop
ARCH 515	2	Techniques Workshop
Total	4	

Thirteen Required Lecture/Seminar Courses and Graduation Project Preparation

Course	Credits	
ARCH 503	3	Introduction to Issues and Ideas in Architecture
ARCH 504	3	Architectural History Ia ¹
ARCH 505	3	Architectural History Ib ¹
ARCH 509	3	Introduction to the Behavioural Basis of Design ¹
ARCH 511	3	Architectural Technology 1 ¹
ARCH 512	3	Architectural Structures 1 ¹
ARCH 513	3	Environmental Systems and Controls 1 ¹
ARCH 531	3	Architectural Technology 2
ARCH 532	3	Architectural Structures 2
ARCH 533	3	Environmental Systems and Controls 2
ARCH 541	3	Process and Practice of Architecture 1
ARCH 542	1	Project Costing
ARCH 548	3	Graduation Project, Report Preparation

A history/theory offering²:

ARCH 523	3	Current Theories of Architecture
Total	40	

¹ These courses are a prerequisite to more advanced level courses and should therefore be completed in the first and second year of the program. ARCH 503, 511, and 515 are taken concurrently with ARCH 500 design tutorial.

² Other history/theory offerings will be available for credit. A published list will be available from the School.

Six Design Courses

Course	Credits	
ARCH 500	9	Arch Design 1A
ARCH 501	9	Arch Design 1B
ARCH 520	9	Arch Design 2A
ARCH 521	9	Arch Design 2B
ARCH 540	9	Arch Design 3A
ARCH 549	9	Graduation Project, Design
Total	54	

Seven Elective Courses which may be selected from the following list:

Course	Credits	
ARCH 517	3	Computer Applications 1
ARCH 522	3	Current Issues in Architecture
ARCH 523	3	Current Theories of Architecture
ARCH 524	3	History of Urban Form
ARCH 525	3	History of Urban Planning, Workshop
ARCH 526	3	History of Theories of Architecture
ARCH 527	3	Meaning in Architecture
ARCH 528	3	Meaning and Behavior in the Landscape
ARCH 529	3	Introduction to Facilities Planning
ARCH 530	3	Urban Design Workshop
ARCH 534	3	Light, Color and Space

ARCH 535	3	Energy and Building Design
ARCH 537	3	Computer Applications 2
ARCH 538	9	Study of Architecture Abroad
ARCH 543	3	Housing and Community
ARCH 544	3	Architecture Seminar
ARCH 545	3	Directed Study
ARCH 565	3	Planning the Residential Environment
ARCH 568	3	Research Methods in Architecture
ARCH 569	3	Behavioral Aspects of the Life Cycle
ARCH 571	3	Seminar on Building Technology
ARCH 572	3	Advanced Structures
ARCH 573	3	Advanced Building Science
ARCH 577	3	Advanced Computer Applications

Total 21
Program Total 119

Note: A student who enrolls in the Study Abroad Program in a year may substitute ARCH 538 (Study of Architecture Abroad) for nine credits of electives and ARCH 539 Design Abroad for one of the nine-credit tutorial courses in ARCH 520, 521 or 540, so as to make up a full term's work abroad.

A student who has valid credit for a course similar to a required lecture course in this program may take an extra elective course in lieu of that required course, but still must complete a total of 119 credits in this program.

Students may undertake courses outside the School of Architecture for credit toward their degree. Such courses must be demonstrated to be relevant to the student's program of study. Students must submit the request for permission to enrol in the course for credit towards the M.Arch. degree, in writing, to the Standing and Promotions Committee. Credit will be granted on presenting a valid transcript from the institution concerned.

Course descriptions are to be found in the alphabetical listings of the Departmental offerings in the *Calendar*. See the School Handbook for more complete details, including term, time, and location of courses.

Standing and Promotion

A student must:

- 1) Obtain at least 60% in any course taken in the program for a student to be granted Pass standing. However, only 18 credits of Pass standing may be counted towards the program; for all other courses credited to the program, at least 68% must be obtained.
- 2) Obtain at least 68% in Arch 500, Arch 540 and Arch 549. Should a student not attain a 68% mark in Arch 500, the following conditions would apply:
 - a) If the mark is less than 60% then the student is required to withdraw from the program for eight months and retake Arch 500 in a subsequent Fall Term;
 - b) If the mark is between 60% and 68% then the student will not be given credit for Arch 500. The student will be required to re-register for ARCH 500 in the following term.

Should a student not attain a 68% mark in Arch 540, then the student must repeat the tutorial.

Failure to obtain credit for a total of three tutorials will require the student to withdraw from the School and the student will not be allowed to re-register in the program.

Fourth Term Review

Faculty approval is required, based on a portfolio including work from ARCH 500, 501, 520 and 521 submitted on completion of ARCH 521, before a student may proceed to ARCH 540. If this approval is not given, the student will be required to re-register in ARCH 521. The criteria to be used in determining faculty approval will be: overall academic standing in design, design ability in a broad range of design topics and demonstration of a 'state of readi-

ness' to proceed with the Graduation Project. Those students who have not maintained an average grade for ARCH 500, ARCH 501, ARCH 520 and ARCH 521 (or ARCH 539 if applicable) of 68% may be required to repeat ARCH 521. Other students may be advised to repeat ARCH 521.

Graduation Project

Special requirements and conditions apply to the Graduation Project, which includes both ARCH 548 and ARCH 549.

Part 1 (ARCH 548): Research, Preparation and Definition of the Graduation Project

In order to enrol in ARCH 548, a student must have successfully completed all the requirements for second year. Each student undertaking ARCH 548 must attain agreement from a member of available faculty (a published list will be available from the School) to act as a Mentor for the project. The Mentor must approve the topic and agree on the approach. A Statement of Intent, approved by the Mentor, must be submitted by the end of the first week of term. A Proposal for a specific project, approved by the Mentor, must be submitted by the end of the seventh week of term. The ARCH 548 Report is due on the last day of course work for the term.

The ARCH 548 Report must be completed in one term and a grade assigned prior to the marks meeting of that term. Should the work be incomplete a fail grade will automatically be assigned. The student may then re-register for ARCH 548 in the following term.

If the ARCH 548 Report is not graded with a satisfactory standing at the end of the term in which it was started, the student may not proceed with ARCH 549 in the following term. Failure to complete ARCH 549 after two attempts will require that the student withdraw from the program for 12 months.

Part 2 (ARCH 549): Design and Presentation of the Graduation Project

No student will be permitted to proceed with ARCH 549 until the student has passed ARCH 548 and reduced any outstanding course requirements to a maximum of 18 credits.

Each student enrolled in ARCH 549 shall work under the supervision of a Committee, the Chair of which will normally be the Mentor from ARCH 548, or else a member of the full-time faculty chosen from the published list. The student, with the approval of the Chair, will select two additional members for the Committee who may be from the School faculty or the community at large. Under the direction of the Chair, the student will call a minimum of four meetings of the Committee at appropriate stages of the project to review progress. At the First Meeting of the Committee, the terms of reference for the project and the expectations of the Committee will be defined. At the Term-End Meeting, to be held by the last day of course work for the term, the Committee will determine whether the project is substantially complete, and is to be prepared for public presentation.

At the Term-End Meeting the following conditions apply: students whose work is judged to be substantially complete and of acceptable quality will be required to make a public presentation of their work at the Final Review on a date scheduled by the School. Work that is not of an acceptable standard will be assigned a fail grade. Should

the Committee decide that the project is not substantially complete it may either assign a fail grade or, alternatively, it may request that the student be given permission to work on the project for one additional term. If the student wishes this extension of time, he must make a presentation to the Committee and an assigned group of faculty. At this time the Committee may, only with the agreement of the assigned faculty, allow the student to continue work on the project. The student must complete the project by the end of that term or else a fail grade will be assigned.

All students eligible to do so must exhibit their projects at the Preview Exhibition scheduled just prior to Final Review. Students whose substantially complete projects are considered by their Committee to be inadequately presented may not be allowed to proceed to Final Review, and will be required to upgrade the presentation for the next Preview Exhibition.

At the Final Review, the grade for ARCH 549 will be established by the Committee in consultation with the assigned group of faculty and guest critic, immediately following the public presentation. In order to obtain credit for the course, the student must attain a mark of not less than 68%.

To complete the requirements for graduation, two documents must be submitted: the thesis and the graduation project report. The thesis is the record of the student's Arch 549 presentation. The graduation project report consists of the thesis and the student's Arch 548 directed studies essay. Both documents must conform to the specifications and procedures set forth in the 'Instructions for the Preparation of Theses and Graduation Project Reports, School of Architecture,' a copy of which is available in the School office. Failure to submit both documents by the specified dates will prevent the student from graduating at the subsequent convocation.

If a fail grade or no credit is assigned for ARCH 549, the student will be required to withdraw from the School for a minimum period of twelve months. The student may then re-register for ARCH 549 and begin again with a new topic, Mentor and Committee. It will be necessary for the student to undertake preparatory work acceptable to the new Committee Chair without credit, prior to re-registering.

Failure to attain the necessary requirements after repeating ARCH 549 will require the student to withdraw from the School, and the student will not be allowed to re-register in the program.

Should the program not be completed in six calendar years from the date of first registering in the School, the student must appeal for permission to re-enrol. Such an appeal will be granted only after it has been reviewed by the Director of the School of Architecture and the Dean of Graduate Studies.

Honours Standing

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 60% will be recognized by the School to have attained Honors Standing. This standing is not an official component of the University grading system.

Portfolio

All students are required to keep a portfolio of their work in each tutorial for review by faculty at the end of each term in which the tutorial is held.

The portfolio must contain, at a minimum, all the presentation drawings from each project in a tutorial, but these

may be reproductions of originals and photographs of other presentation materials such as models, etc.

The portfolio is to be kept available for review in case of an appeal of grade in the tutorials or other dispute regarding the student's standing.

Advanced Standing

Depending on previous experience and success in both graduate level studio and course work, in certain circumstances students may be given advanced standing in the program. This will be on a course for course basis and normally only granted when valid graduate level credit has been obtained at another institution in the subject area concerned and the School is satisfied that the work is equivalent.

Advanced standing will be considered only on the recommendation of the student's adviser and current tutorial Chair and the approval of the Dean of the Faculty of Graduate Studies.

Supplementary Work

No Supplementary work is available in tutorials.

For courses other than tutorials, the normal university regulations apply. Only in exceptional circumstances will a student be allowed to undertake supplementary work in those other Architecture courses which are assessed on a continuing basis throughout the term.

Evaluations and Appeals

In the event that a student disagrees with the evaluation for a particular course, the student should first consult the instructor of the course and then, if necessary, seek the advice of the Chair of the Standings and Promotions Committee. If a re-read of a course examination is requested, the student should follow the normal university procedure.

In the event that a student disagrees with the evaluation in a design tutorial, a student should:

- 1) Consult the design tutor(s) involved, and then, if still not satisfied, formally request in writing to the director that an appeal committee be established to hear the case. This request will only be granted if it occurs within one week from the time the marks are available on TELEREG and will not be granted if, in the interim, the student has enrolled in and completed an additional tutorial. The tutorial appeals committee will consist of three of the full-time design tutors plus the Director, ex-officio, and it will have the authority to interview all persons involved and to recommend to the director that the grade be affirmed or changed. The decision of the Director shall be final with respect to the academic aspect of the appeal. Any change of grade must be approved by the Dean of the Faculty of Graduate Studies.
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Practical Experience

In the summer months students are encouraged to gain practical experience in areas closely related to their interests in the School. Travelling is encouraged, or work in an architect's, engineer's, landscape architect's or planner's office. Alternatively, research is suggested at a university or with a public or private organization. Experience in the field of construction is also recommended. The School will advise the student whenever possible.

Professional Registration

The practice of architecture in Canada is governed by legislation enacted by the Provinces. The Architectural Profession Act in British Columbia prescribes the qualifications for membership including academic and experience requirements. Legal protection of the title "Architect" is contained in the Architectural Profession Act.

The architectural profession has undergone significant changes in both structure and operation particularly with respect to the objectives, standards and procedures affecting admission to the profession. The first of these developments relates to academic qualifications. The Provincial Associations (except Quebec) have established the Canadian Architectural Certification Board which administers a national program of academic certification and which has been adopted as a pre-requisite to registration in each of the Provinces.

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Anticipated Expenses Involved

Apart from the cost of living and tuition, certain additional expenses must be anticipated to cover books, equipment, Introductory Workshop (Arch 502), the computer lab and the materials shop.

Students electing to participate in the Study Abroad program must be prepared to meet further expenses.

Master of Advanced Studies in Architecture M.A.S.A.

See Faculty of Graduate Studies.

Academic Staff**Professor and Director**

SANFORD IHRSDIEN, A.B., B.Arch. (Col.), F.A.I.A., M.A.I.B.C., F.R.A.I.C.

Professor

RAYMOND J. COLE, B.Sc. (Civil Eng.) (City University, London), Ph.D. (Wales).

Associate Professors

ANDREW GRUFT, B.Arch. (Cape T.), M.R.A.I.C., M.A.I.B.C.

PATRICIA PATKAI, B.L.D. (Manit.), M.Arch. (Yale), M.R.A.I.C., M.A.I.B.C.

MOURA QUAYLE, B.L.A. (Guelph), M.L.A. (Calif., Berkeley),
M.B.C.S.I.A., F.C.S.I.A., M.C.F.L.A.

RONALD B. WALKER, B.Arch. (Brit. Col.), M.Arch. (Calif., Berkeley),
M.R.A.I.C.

JERZY WOJCIWICZ, B.Arch. (Hon.) (Manit.), M.Arch., Dr. Des. (Harv.),
M.O.A.A., M.A.I.B.C.

WOODRUFF W. WOOD, B.Arch. (Oregon), M.A.I.B.C., F.R.A.I.C.,
B.C.S.I.A. (Hon.).

Assistant Professors

LINDA D. BROCK, B.A. (Montana), M.Arch. (Utah), M.Des.S. (Bldg.
Techn.) (Harv.), M.A.I.B.C., N.C.A.R.B.

JOHN A. GAITANAKIS, B.Arch., M.Arch. (Oregon), M.A.I.B.C.,
M.R.A.I.C., Reg.Arch. U.S.A., M.N.A.I. (Norway).

DINO P. RAPANOS, B.Arch., M.Arch. (Brit. Col.), M.A.I.B.C.

JOEL SHACK, B.Arch. (Tor.), M.O.A.A.

GEORGE S. WAGNER, B.A. (Bard College, NY), M.Arch. (Wash.).

DEBORAH E. B. WEINER, B.A., M.A. (Calif., Berkeley), M.A. (Calif., Los
Angeles), Ph.D. (Princ.).

Senior Instructor

STEPHEN I. TAYLOR, B.A.Sc. (Brit. Col.), M.S. (Cal. Tech.), P.Eng.,
A.P.E.B.C.

Adjunct Professors (1994/95)

GLENN HARDIE, M.Ed. (Brit. Col.), F.R.I.C.S.

SHELAGH LINDSEY, B.A. (Tor.), M.A., Dipl. Educ. TV. (Stan.).

SHERRY MCKAY, B.A., M.A., Ph.D. (Brit. Col.).

EVA MATSIZAKI, B.Arch. (Cincin.), M.A.I.B.C., F.R.A.I.C.

BRIAN PALMQUIST, B.Sc. (Arch.), B.Arch. (McG.), M.A.I.B.C.,
M.R.A.I.C., M.O.A.A.

ZWANETTE PEREBOOM, B.Sc., M.Arch., LL.B. (Brit. Col.), M.L.S.B.C.,
M.A.I.B.C., M.R.A.I.C.

WILLIAM THOMSON, Mech. Eng. Dipl. (Chelsea Polytechnical, London).

Sessional Lecturers (1994/95)

MARK BOUTIN, B.E.S. (Manit.), B.Arch. (Brit. Col.).

EJAINÉ DIDYK, B.Arch. (Tor.).

NORMAN HILDESHEIM, B.Arch., M.Arch. (Harv.), M.Lit. (Cantab.).

MICHAEL MCCOLL, B.A., B.Arch. (Hon.) (Brit. Col.).

ELIZABETH SHOTTON, B.Comm. (Car.), B.Arch. (Brit. Col.).

JEFF VASEY, B.Arch. (Wat.).

Post Doctoral Teaching Fellow (1994/95)

DAVID VANDERBURGH, A.B. (Harv.), M.Arch., Ph.D. (Calif., Berkeley).

Admission

Admission requirements are specified in the General Information section of the *Calendar* (see Index under "Admission to the University").

Effective September 1996 students admitted to the B.A. or B.F.A. programs by transfer from other post-secondary institutions must either have met the Faculty of Arts English Requirement or be eligible to enrol in first-year English at the time of admission. See "The English Requirement" below.

Advanced Credit and Advanced Placement

The Faculty of Arts may grant advanced placement and/or course credit to students who complete certain International Baccalaureate, Advanced Placement or other enriched secondary school courses with appropriate grades. When granted, the credit/placement will be indicated on the student's notification of acceptance to UBC.

Advising

Degree, Program, and course advice is provided through the Arts Faculty Advising Office, located in Room A200 of the Buchanan Building, and through departmental and General B.A. advisers.

The staff of the Faculty Advising Office assist first and second year students to plan their programs, and offer advice about Arts Faculty regulations to all students in the Faculty; they also administer regulations governing B.A. and B.F.A. degrees, and evaluate and approve (as appropriate) requests for course changes, withdrawals, academic concessions (for medical, emotional or other reasons), and letters of permission for study elsewhere. This office does not advise students about the requirements for admission to, or continuation in, other faculties. Students should contact other faculties directly for such information.

Departmental advisers, who are located in the relevant department, advise students about Major, Minor, Double Major and Honours programs in that department. Advisers for students in the General B.A. program can be contacted through the Faculty Advising Office. (See "Program Planning" and "Program Requirements" below.)

The Faculty Advising Office is open to students from 10:00 am to 12:00 pm and 2:00 pm to 4:00 pm, Monday to Friday. Students may "drop-in" to speak with a faculty adviser or an advising officer during these hours. To schedule an appointment with an advising officer or the Assistant Dean, students should contact the office in person, by telephone (604) 822-4028, or by mail (addressed to the Faculty Advising Office, Office of the Dean of Arts, The University of British Columbia, Buchanan Building, 1866 Main Mall, Vancouver, B.C., V6T 1Z1).

Program Planning

Every student is responsible for drawing up a program of study that meets faculty, departmental, and degree program requirements. All students should consult appropriate Faculty Advising Office staff and departmental or General B.A. advisers (as applicable), in the preparation of their program of study. However, the responsibility for meeting requirements is the student's.

Although most degree programs are of four years' duration (implying successful completion of 30 credits per year), students may take more or less time than this to complete degree requirements. Credit obtained in Summer Sessions can be combined with that obtained in Winter Sessions. Students wishing to register for more than 15 credits in Summer Session (or for more than nine

The Faculty of Arts

The Faculty of Arts, through its Schools and Departments, offers the following degrees and diplomas:

- Bachelor of Arts (B.A.)
- Bachelor of Fine Arts (B.F.A.) in Creative Writing, Fine Arts, and Theatre
- Bachelor of Music (B.Mus.)
- Bachelor of Social Work (B.S.W.)
- Diplomas in: Applied Linguistics, Applied Creative Non-fiction, Art History, Film Studies, French Translation

Information about the programs leading to these degrees and diplomas is given below, and in the sections for the Schools of Music and Social Work.

For information about the M.A., M.F.A., M.A.S., M.L.S., M.Mus., M.S.W., Ph.D., and D.M.A. degrees, see the Faculty of Graduate Studies section.

credits in either Term 1 or Term 2 of Summer Session) must obtain permission to do so from the Faculty Advising Office. Likewise, students wishing to register for more than 30 credits in any Winter Session, must obtain permission to do so from the Faculty Advising Office, unless they are enrolled in a program that requires more than 30 credits in the session. In Summer and Winter Sessions such authorization is normally given only to students with high academic standing.

Students who register in fewer than 27 credits per Winter Session are not normally eligible for scholarships; those registered in fewer than 18 credits are ineligible for recognition on the Dean's Honour List.

Attendance

Regular attendance is expected of students in all their lectures, laboratories, tutorials, seminars, etc. Students who neglect their academic work and assignments in a course may be excluded from its final examination. Students who are unavoidably absent from scheduled classes because of illness or disability should report to their instructors immediately on their return. Students whose attendance or academic performance is severely affected by medical, emotional, or other problems should apply for special consideration through the Faculty Advising Office. (See "Academic Concession" below and in the General Information section of the *Calendar*.)

Change of Registration

In the Winter Session, one-term courses may be dropped without record from a student's program within two weeks of their commencement; two-term courses may be dropped without record within three weeks of their commencement. Thereafter, students may withdraw from a one-term course up to the end of the sixth week, and from a two-term course up to the end of the twelfth week of classes, with approval from the Faculty Advising Office. If granted, such withdrawal will be recorded on the transcript by a "W". Students are not normally permitted to withdraw from courses after these dates (or their Summer Session equivalents, which may be ascertained at the Faculty Advising Office).

Students who cease to attend or otherwise fail to complete exams, assignments or other course requirements will receive a grade reflecting requirements completed in the course. (See also "Change of Registration" and "Withdrawal" in the General Information section of the *Calendar*.)

Academic Concession

Students whose attendance or academic performance is severely affected by medical, emotional, or other problems should apply for special consideration through the Faculty Advising Office. They will be required to complete an application for Academic Concession form and provide supporting documentation as requested. In some cases it will be necessary for the student to attend an interview. Academic concessions are granted only by the senior staff of the Faculty Advising Office, and are a privilege not a right. Among academic concessions that may be granted are Aegrotat Standing, Deferred Standing, and withdrawal from the university.

- Aegrotat Standing allows a student credit for a course, although the student has not completed course requirements due to medical, emotional or other difficulties. This standing is awarded only if the course instructor and the Dean agree that the student has demonstrated the ability to deal with the course material satisfactorily. When AEG standing is awarded, a letter grade is assigned; this will be converted to the minimum percentage for that category for the calculation of averages.
- Deferred Standing may be granted when a student has a valid reason for not completing course requirements as scheduled, but does not qualify for aegrotat Standing. Students granted deferred standing in Winter Session courses **must complete** all outstanding course requirements no later than August 24 following. Students granted Deferred Standing in Summer Session courses must complete all outstanding work no later than December 23 following. Students granted deferred standing are responsible for making satisfactory arrangements with their instructors for completion of outstanding course requirements. If a student fails to

complete deferred requirements by the dates specified, the deferred standing will be replaced with a grade or standing that reflects requirements completed in the course. Students unable to meet the specified deadlines because of further medical, emotional or other difficulties **must** make an additional application for Academic Concession no later than August 31 (for Winter Session courses) or December 31 (for Summer Session courses) following the original deferral. (See also "Academic Concession" and "Grading Practices" in the General Information section of the *Calendar*.)

Transfer Credit

Students entering the Faculty of Arts from a college or another university will receive credit for appropriate courses completed there, subject to the provisions listed in the General Information section of the *Calendar* (see "Applicants for Transfer from a College or University in British Columbia") and in the Faculty Requirements section below.

Effective September 1996 students who are accepted by transfer from other post-secondary institutions must either have met the English Requirement or be eligible to enrol in first-year English at the time of admission.

Students in the Faculty of Arts who wish to interrupt their UBC studies and take courses in other institutions for credit toward a UBC degree must obtain, in advance, a Letter of Permission from the Faculty Advising Office.

Students currently registered in UBC courses may **not** take courses for credit toward the B.A. at other institutions without specific written permission from the Faculty Advising Office.

The Faculty has no obligation to grant transfer credit unless a Letter of Permission has been obtained.

Students will not normally be permitted to complete the Faculty of Arts English Requirement at another institution. (See also "Attendance" in the General Information section of the *Calendar*.)

Granting of Credit

Credit is granted for all courses completed with at least the minimum passing grade (normally 50%), provided they are eligible under the requirements specified for the degree.

Failed Courses

A student may repeat a failed course only once. This restriction does not apply to courses required to satisfy the Arts Faculty Language Requirement or to Mathematics 100 and Mathematics 140, each of which may be repeated twice.

Failed Standing

Students in the Faculty of Arts who register in (and do not officially withdraw from) 12 credits or more in any session, and obtain a sessional average of less than 45% will be assigned Failed Standing and required to withdraw from the faculty. They may apply for re-admission after one year. Students required to withdraw who have completed 51 or fewer Arts eligible credits will be readmitted if:

- 1) they attend a B.C. College or similar institution and complete the required number of university transfer credits specified below before seeking readmission to UBC.
- 2) they meet the appropriate GPA for college transfer students.

No. of credits completed	No. of university transfer credits required
≤ 30	30
39 - 45	24
48 - 54	21

Continuation Requirements and Academic Probation

Students in the Faculty of Arts who have completed 30 credits of course work at UBC and who have not yet obtained an LPI score of level 5 will be required to discontinue their UBC studies. They will be considered for readmission when they have met the Faculty of Arts English Requirement or achieved eligibility to enrol in first-year English.

Students in the Faculty of Arts who **a)** register in (and do not officially withdraw from) 12 credits or more in any session and have a sessional average of more than 45% but less than 55% or **b)** register in fewer than 12 credits in any session and have a cumulative average of less than 55% at the end of that session, are placed on Academic Probation. This will be noted on their statement of grades.

Students on academic probation must maintain an average of at least 55% in each subsequent session for continuation. Should they not do so, they will be assigned Failed Standing and required to withdraw from the Faculty. They may apply for re-admission after one year, but no student required to withdraw has a right to re-admission.

All students in the Faculty of Arts must obtain a **cumulative** average of at least 55% on the final 60 credits of their program in order to graduate.

Supplemental Examinations

The Faculty of Arts does not offer supplemental examinations in any of its courses.

Letter of Permission

See "Transfer Credit" above.

Scholarships and Awards

Information on scholarships and awards available to academically outstanding students can be found in the General Information section of the *Calendar* (see "Awards and Financial Aid") and in the student awards supplement to the Winter Session *Calendar*.

Dean's Honour List

Students who complete 18 credits or more in any Winter Session with an overall average that places them in the top five percent of students in the Faculty receive the notation "Dean's Honour List" on their permanent records.

Faculty Requirements

B.A., B.F.A. and B.Mus. Degrees

- All programs leading to the B.A., B.F.A. and B.Mus. degrees require a minimum of 120 credits.
- No more than 60 credits completed at other post-secondary institutions can be counted toward the B.A. degree at UBC. (Special conditions apply to students transferring to UBC from UBC degree completion programs at University College of the Cariboo and Okanagan University College; they may transfer a maximum of 90 credits should they wish to complete their B.A. degree program at UBC.)
- No more than 60 credits of UBC Guided Independent Study courses can be counted toward the B.A. degree; no more than 12 such credits may be taken after the completion of 60 credits toward the degree program.

Unless special permission is given in writing, in advance, by the Faculty Advising Office, students must complete their final 30 credits at UBC. At least 30 of the final 60 credits toward the degree must be completed at UBC (or through UBC-GIS courses).

- Students are not permitted to register in more than 12 Science credits (18 including Mathematics and Computer Science courses) before completing 30 credits in the Faculty of Arts.
- All students in the B.A. and B.F.A. programs must complete the following:
 - 1) the Faculty of Arts English requirement
 - 2) the Faculty of Arts Language requirement
 - 3) the Faculty of Arts Science requirement
 - 4) the Faculty of Arts Literature requirement

Each is specified in more detail below. Every effort should be made to complete these requirements in the first 60 credits. Students who fail to meet the English requirement before completing 60 Arts-eligible credits will not be permitted to register in courses other than first-year English until this requirement is satisfied. Students who have not satisfied the Language requirement must maintain their registration in course(s) leading to its fulfilment through all Winter and Summer Sessions attended until the requirement is met. Students intending to enter the General B.A. program must satisfy the Language requirement before registering in that program.

All students in the B.Mus. program must complete the Faculty of Arts English and Literature requirements.

The English Requirement

- Successful completion of six credits of first-year English or Arts One.

Students admitted to the B.A. program must take immediate steps to satisfy the English Requirement.

Notes

- 1) Students admitted directly from secondary school are required to take English in their first year if eligible to do so. To be eligible, students must have written the Language Proficiency Index (LPI) examination and obtained a score of level 5. For details on this examination, and exceptions from it, see "Language Proficiency Index (LPI) Requirement for First-Year English" in the Admissions section of the *Calendar*.
- 2) Students admitted directly from secondary school who have not obtained a score of level 5 on the LPI should not register for more than 12 credits per term and are advised to take a non-credit course from the University Writing Centre.
- 3) Students who do not achieve a level 5 LPI score before completing 30 credits in Arts-eligible courses will not be permitted to register in any additional credit courses until they obtain a level 5 score on the LPI examination.
- 4) **Effective September 1996** students seeking admission to the B.A. program on transfer from another post-secondary institution, or readmission after being required to discontinue, must have met the English Requirement, or if not, be eligible to enrol in first-year English at the time of admission or readmission (i.e., must have obtained a score of level 5 on the LPI).
- 5) Students who do not complete six first year English credits in their first 60 Arts-eligible credits, taken either at UBC or another post-secondary institution, will not be permitted to enrol in courses other than first-year English until the English Requirement is met.

- 6) Students who fail a first-year English course (i.e., ENGL 110, 111, 112, 120 or 121) may repeat that course once only.
- 7) Once admitted to UBC students will not normally be permitted to satisfy the English requirement at another institution.

The Language Requirement

Either:

- 1) successful completion of a Grade 12 course in an approved language other than English;
- or:
- 2) successful completion of either 6 or 12 university credits in a language other than English according to the requirements below.

Six-credit Requirement

Students who have passed Grade 11 in one of the languages listed below, and who continue the study of that language, will meet the Language requirement by successful completion of the course indicated in the table below.

French ¹	FREN 110 (6)
Spanish ² (with grade A or B)	SPAN 200 (6)
Spanish ² (with grade C or P)	SPAN 110 (6)
Hebrew (Maimonides School)	HEBR 405 (6)
Italian (School District 39)	ITAL 200 (6) or ITAL 201 (6)
Mandarin Chinese	CHIN 101 (6)
Russian (School Districts 9 and 12)	RUSS 200 (6)
Japanese	JAPN 101 (6) or JAPN 103 (6) or JAPN 104 (6)

German³

¹ Students with Grade 11 French will not normally receive credit for the completion of French 105, or its equivalent elsewhere.

However, placement will be decided by a departmental test in case of doubt, and credit will be granted for all courses completed with prior permission.

² Students with Grade 11 Spanish will not receive credit for the completion of Spanish 100. It is understood that students with Grade 11 Spanish have also studied Spanish 9 and 10 or Spanish 11B.

³ See Note 1 of "Twelve-credit Requirement" (below).

Twelve-credit Requirement

If the student has not passed Grade 11 in an approved language other than English, or chooses to meet the Language requirement through study of a language other than one completed to the Grade 11 level, 12 credits in a single language are required.

French:	FREN 100 (12); or FREN 105 (6) and FREN 110 (6)
Spanish:	SPAN 105 (12); or SPAN 100 (6) and SPAN 110 (6) /SPAN 200 (6)
Italian:	ITAL 100 (6) and ITAL 200 (6); or ITAL 101 (6) and ITAL 201 (6)
Portuguese:	PORT 102 (6) and PORT 202 (6)
German ¹	GERM 104 (12); or GERM 100 (6) and GERM 200 (6); or GERM 110 (6) and GERM 210 (6)
Scandinavian:	SCAN 301 (6) and 401 (6)
Mandarin Chinese ² :	CHIN 180 (12); or CHIN 100 (6) and CHIN 101 (6)
Japanese:	JAPN 180 (12); or JAPN 100 (6) and JAPN 101 (6); or JAPN 102 (6) and JAPN 103 (6)
Korean:	KORN 102 (6) and KORN 200 (6)

Hindi ³ :	HIND 110 (12); or HIND 102 (6) and HIND 200 (6)
Indonesian:	INDO 102 (6) and INDO 200 (6)
Punjabi:	PUNJ 102 (6) and PUNJ 200 (6)
Sanskrit:	SANS 102 (6) and SANS 200 (6)
Asian Languages:	ASLA 300 (6) and ASLA 400 (6)
Arabic (Classical):	ARBC 300 (6) and ARBC 400 (6)
Greek:	GREK 100 (6) and GREK 200 (6)
Latin:	LATN 205 (12); or LATN 100 (6) and LATN 200 (6)
Hebrew (Biblical):	HEBR 305 (6) and HEBR 405 (6)
Russian:	RUSS 110 (12); or RUSS 100 (6) and RUSS 200 (6); or RUSS 102 (3), RUSS 103 (3) and RUSS 200 (6)
Polish:	POLS 110 (6) and POLS 210 (6)
Ukrainian:	UKRN 325 (6) and UKRN 425 (6)

¹ Students with secondary school German or German-language background wishing to register in German language courses are required to take a placement test before the beginning of classes. They will be placed in a German language course according to their competence in the language and regardless of the level of their previous study. Students placed in German 200 or German 210 will satisfy the language requirement by successful completion of this course. Students placed in German 100 or German 110 are required to complete that course and German 200 or German 210 successfully to satisfy the language requirement. Credit will be assigned for all courses completed successfully, regardless of the level of previous study.

² Students with secondary school Chinese (Japanese) or Chinese-language (Japanese-language) background wishing to enrol in Chinese (Japanese) language courses are required to attend a placement interview administered in late August by the Department of Asian Studies (see the UBC *Registration Guide* for exact time and place). They will be placed in a Chinese (Japanese) language course according to their competence in the language and regardless of the level of their previous study. Credit will be assigned for all courses completed successfully, regardless of the level of previous study. Students judged to have a language competence beyond the level of Chinese (Japanese) 101 will be asked to take the Chinese (Japanese) language proficiency examination.

³ Students with knowledge of another North Indian language before entering the university may also satisfy the requirement with Hindi 110 (6).

Students may satisfy the language requirement in any of the above languages by proving the appropriate competency through examination. Arrangements for such examination must be made through the Faculty Advising Office. No course credit will be awarded for satisfaction of the language requirement in this manner.

Students who wish to present a language other than those identified above to satisfy the language requirement may be permitted to do so through a challenge examination, where appropriate expertise to test the student's competency in the language is available. Arrangements for such examination must be made through the Faculty Advising Office. No course credit will be awarded for satisfaction of the language requirement in this manner.

The Science Requirement

The requirement can be met by successful completion of:

- 1) six credits in the Faculty of Science or
- 2) Geography 101, or Geography 102 and three additional credits in a Faculty of Science course, or Geography 103 and three additional credits in a Faculty of Science course, or Geography 102 and Geography 103 or
- 3) Forestry 300 or
- 4) Human Nutrition 351 and three additional credits in a Faculty of Science course.

Science courses that include laboratory work are recommended. Students may, however, choose to meet the

Science requirement through successful completion of six credits from the following list of courses:

Biology 343, 344, 345, 346, 446
Geology 310
Geophysics and Astronomy 310
Mathematics, all courses
Oceanography 310
Physics 140, 340, 341

The Literature Requirement

- successful completion of six credits, in the Faculty of Arts, of work in literature in addition to the English requirement.

Courses in composition and writing (such as English 301, English 303, Creative Writing 202, Creative Writing 301) and courses intended to develop fluency in reading newspapers, etc. in languages other than English (e.g. Japanese 315, Japanese 416, Chinese 300) do not satisfy this requirement.

With these restrictions, eligible courses are:

Asian Studies:	302, 335, 345, 350, 375, 415, 435, 445, 447
Chinese:	all 300- and 400-level courses except 300, 301, 302
Classical Studies:	310, or six credits from 313, 314, 317, 318
English:	all 200-level courses; ENGL 310-319, 330-337, 341-451 (provided the student has completed a minimum of 54 credits of which at least six must be from first-year English)
French:	220, 300, 320, 321, 330, 400, 403, and all 400-level literature courses except 401, 402, 426, 499
German:	202, 301, 302, all 300- and 400-level literature courses
Greek:	all 300- and 400-level courses in Greek except 425
Hindi:	405, 410*
Italian:	all Italian 300- and 400-level literature courses except 449
Italian Studies:	310, 431
Japanese:	all 300- and 400-level courses except 301, 302, 310, 315
Latin:	all 400-level courses in Latin except 425
Religion:	311
Russian:	206, 207, 306, 407, 408, 409, 410, 411
Sanskrit:	300*
Scandinavian:	410, 411, 412
Slavic Studies:	307
Spanish:	220, 311, 312; all 300- and 400-level literature courses except 349, 444, 449
Theatre:	220
Urdu:	401*
Women's Studies:	224

* with the permission of the Department of Asian Studies

Program Requirements

Students are advised to plan their 100- and 200-level courses with their entire program in mind, although they formally declare their specific program of study only on completion of at least 54 (and not more than 75) credits.

Students in their first 30 credits of university-level study may register in any 100-level Arts or Science course for which they have the appropriate pre-requisite. In addition, there are a limited number of 200- and higher-level Arts courses for which they may be eligible. For further information, students should consult the publication *Courses Open to First-Year Students* which is available in the Arts Advising Office.

Students seeking entry into 200- (or in exceptional cases 300-) level language courses should consult the appropriate department for placement.

Students granted advanced credit or advanced placement may register in appropriate courses numbered 200-299 in the subjects in which they have received such credit/ placement.

Students accepted into Creative Writing 202 with written permission from the Department of Creative Writing may include that course in their first 30 credits.

Students registered in their second 30 credits (31 to 60 credits in total) must include at least 24 credits of 100- or 200-level Arts or Science courses. They may take up to six credits of 300-level courses for which they have the appropriate pre-requisites, or up to six credits from courses in Faculties other than Arts and Science.

Students who have completed 60 credits may register in any courses for which they have the appropriate pre-requisites, subject to the following restrictions.

In the 120 credits required for the degree, there may be:

- No more than 72 credits in courses at the 100 and 200 level.
- No more than six credits in courses at the 500 level. (For further information on enrolment in graduate courses, see the end of this section.)
- No more than six credits from courses in Faculties other than Arts or Science (except as specified in the program requirements section below).

After completing at least 54 credits and no more than 75 credits, students must enter one of the following programs. Depending on the program chosen they must make application to do so, or identify their program on TELEREG (see below under individual programs for those requiring formal application, and the procedures to be followed in applying for them).

Major Program: This program involves specialization in a single field of study. It may lead to graduate study if a sufficiently high average is obtained.

Double Major Program: This program involves specialization in two fields of study. It is an ambitious program allowing a dual focus with few electives outside the Major subjects.

Honours Program: This program involves intense specialization in a single field of study. It is the preferred route to graduate study in many fields. Entry requires high academic standing.

General Program: This program permits a student to select courses that will provide a broad liberal education, encompassing several disciplines with a limited concentration in one discipline.

All students must draw up a plan of study and consult with the relevant departmental or program Adviser(s) on entering a Major, Double Major, Honours or General program. Further consultation with an Adviser is recommended on completion of 90 credits toward the B.A. Students must, however, recognize their responsibility for ensuring that they meet all Faculty and Program requirements.

Programs

The Major

To graduate with a major, a student must include in the 120 credits required for the degree at least 42 credits but no more than 60 credits in one subject (discipline) or field of specialization. At least 50 of these credits must be in courses numbered 300 or above. Students may graduate with a major in Creative Writing on completion of 36 credits in that discipline, provided all are numbered 300 or above.

For the purposes of this regulation, subjects (disciplines) are defined by their course titles (so that both Studio and Art History courses designated FINA are in the same discipline, for example). Fields of specialization (such as International Relations, Women's Studies or Canadian Studies) are defined by the courses specified under these fields in the Programs of Study section of the *Calendar* (below). When departmental regulations allow credit for a course (or courses) numbered 300 or above in other departments as part of the major (or other) program, such courses must always be counted as credits toward that major (or other) program if completed by students in that program.

Cross-listed courses (indicated in the Courses of Instruction section of the *Calendar* as "Also listed as xxx", e.g., FINA 359/RELG 311) must be counted in the 60-credit limit if the student is a major in either department.

With written approval from the Departmental or Program Adviser and the Faculty Advising Office, students may include in their programs up to six credits in courses outside the Faculties of Arts and Science, in addition to the six such credits permitted all Arts students. This provision is intended to allow students to pursue a particular specialization within the Major, and will not be invoked without a clear justification of the centrality of the course(s) to the student's program. Any credits completed under this provision must be counted in the 60 credit limit for the Major.

The Minor

Students in a Major program may construct their program to include a Minor in a subject (discipline) or field of specialization other than the Major. To complete a Minor a student must include in the 120 credits required for the degree at least 30 credits and no more than 42 credits in a single subject or field of specialization other than that of the Major, including any courses specified as required for a Minor in the discipline or field of specialization. At least 18 of these credits must be in courses numbered 300 or above. Some Interdisciplinary Minors are defined as 18 to 21 credits in specified courses numbered 300 or above, and their prerequisites.

At least 24 of the 120 credits required for the degree must be in subjects or fields other than those of the Major and Minor.

The general provisions regarding the definition of subjects and cross-listed courses in the Major apply to the Minor (see "The Major", above). Only courses in the Faculties of Arts and Science can be credited toward the Minor.

The Double Major

To graduate with a Double Major, a student must include in the 120 credits required for the degree at least 42 credits (and no more than 48 credits) in each of two subjects (disciplines) or fields of specialization. At least 30 credits in each subject/field must be in courses numbered 300 or above.

The general provisions regarding the definition of subjects, cross-listed courses and courses outside the Faculties of Arts and Science in the Major apply to Double Major programs (see "The Major", above).

The Honours Program

To graduate with an Honours degree, a student must complete at least 60 but no more than 72 credits in one subject (discipline) or field of specialization. At least 48 of these credits must be in courses numbered 300 or above, and at least 54 of the required credits must be in courses numbered 300 or above. Departments (and some individual programs) may require more than 120 credits for the completion of an Honours degree.

The general provisions regarding the definition of subjects, cross-listed courses, and courses outside the Faculties of Arts and Science in the major apply to Honours programs (see "The Major", above).

Honours programs are open only to students who, in the opinion of the department, have shown special aptitude and capacity to profit from working intensively in the subject or field. An average of at least 68% on all credits attempted is required for entry into and graduation from Honours programs; some departments may have more stringent requirements, or require higher marks on certain courses. Departments may also require students to maintain a specified average in order to continue in an honours program.

The Combined Honours Program

Students who wish to pursue a course of study combining more than one Honours program may do so with written approval, from both departments and the Faculty Advising Office, of a program of study specified in advance. Approval should normally be obtained before completion of the first 60 credits toward the B.A. Such programs almost invariably require completion of more than 120 credits.

The following table summarizes the **minimum credits** required for the various programs described above.

	Major	Major+ Minor	Major+ Major	Honours
Total overall	120	120	120	120
of which courses 300+	48	48	60	54
Total within specialties (ies)	42	42+30	42+42	60
of which courses 300+	30	30+18	30+30	48
Total outside specialty (ies)	60	24	24	48

The General Program

Students admitted to the General Program usually design their own course of study, and then consult with an Adviser to obtain approval. The Program may be appropriate as preparation for professional programs in other Faculties, including Elementary and Secondary Education, Law, and Library/Information Studies. The Program is distinct from departmental Majors and Honours programs, and is not intended as preparation for graduate studies in the academic disciplines of this Faculty or the Faculty of Science although it may provide an appropriate route to further study in the Creative and Performing Arts. It is administered by the Board of Studies for the General B.A.

Admission

To be admitted to the General B.A. program, students must have:

- 1) completed at least 54 and no more than 75 credits towards the B.A. degree,
- 2) obtained an overall average of at least 60% in all previous courses attempted towards the B.A. degree,
- 3) satisfied the Faculty of Arts English and Language Requirements, and
- 4) obtained approval of their proposed course of study.

Applications will be evaluated twice a year, and must be received before May 15 and September 7 of each year. Inquiries should be addressed to the General B.A. program, Faculty of Arts, Room A200 Buchanan Building, telephone (604) 822-2595.

Requirements

Acceptable disciplines and courses are classified by the Board into four categories: Humanities, Social Sciences, Creative and Performing Arts, and Sciences. Disciplines are as defined by the Board and do not necessarily coincide with existing departmental divisions in the Faculty (e.g., courses in English and other "language departments" are allocated to either "Language" or "Literature", which constitute separate disciplines within the General B.A.).

Students must complete:

- 1) at least 30 credits of 300/400-level course work in one category, including an 18 credit "primary concentration" in one discipline, and
- 2) at least 12 credits of 300/400-level course work in one other category.

Except for those undertaking Thematic Options or Special Individual programs, students may complete no more than 18 credits of 300/400-level course work in any one discipline. Departments will identify any courses that they consider inappropriate for a General B.A. concentration. With the written approval of the General B.A. Board and the Assistant Dean, students may include in their programs up to six credits in courses outside the Faculties of Arts and Science, in addition to the six such credits permitted all Arts students. After completing 90 credits, students must consult with an assigned Adviser and obtain specific approval of their remaining course work. For graduation, students must complete all Faculty of Arts requirements, including the English, Literature, Language, and Science requirements.

Thematic Options and Special Individual Programs

Thematic Options are interdisciplinary programs developed by faculty members. A Latin American Studies Thematic Option is currently offered. In exceptional cases, special individual programs may be designed by students in close consultation with an assigned adviser. For individual programs, the student must have obtained an overall average of at least 65% in all previous courses attempted towards the B.A. degree. In Thematic Options and special individual programs, up to 24 credits may be taken in one discipline provided that the course work for these credits involves more than one department.

Enrolment in Graduate Courses

Outstanding students who have completed at least 90 credits may be allowed to register in up to six credits of courses in the Faculty of Arts at the 500 level toward the

B.A. degree. Normally such permission will be given only to students in an Honours program with a minimum overall average of 80%. Whenever such permission is granted, the Department or Program Adviser must notify the Assistant Dean in writing before the permission takes effect.

B.F.A. Degree**Faculty and Program Requirements**

B.F.A. Degrees are offered in Creative Writing, Fine Arts, and Theatre (in which there are two distinct programs of study: Acting; and Design/Technical Theatre).

Students may enter a B.F.A. program from the Faculty of Arts or as transfer students from another post-secondary institution. In all cases, students must complete the Faculty of Arts English requirement, Language requirement, Science requirement and Literature requirement, each of which is described in more detail above. (See "Faculty Requirements" above for B.A., B.F.A. and B.Mus. degrees.)

Application procedures and deadlines for each of the B.F.A. programs are specified in the appropriate departmental entries under "Programs of Study" below.

Except as noted below, all Faculty and Program requirements applicable to the B.A. degree also apply to B.F.A. degree programs. Students in, or intending to enter, a B.F.A. program should familiarize themselves with, and follow, the requirements laid out in the Faculty of Arts section of the *Calendar*.

B.F.A. programs require that certain pre-requisites be completed in the first 30 and first 60 credits of the student's post-secondary program; these are specified in the "Programs of Study" section of the *Calendar*.

The B.F.A. programs in Fine Arts and Theatre are highly specialized, and require the same level of concentration in their respective fields as do Honours B.A. programs.

The B.F.A. in Creative Writing may be completed as a Major, Double Major or Honours program according to the regulations specified for these programs in the B.A. section of the *Calendar* above.

All programs leading to the degree of B.F.A. require a minimum of 120 credits.

Anthropology

The Department of Anthropology and Sociology offers programs of study that lead to the degrees of Ph.D., M.A., B.A. (See also Museum Studies.)

Requirements for the B.A. Degree**Major:****First and Second Years**

- Anthropology 100
- Anthropology 103 and/or 140
- three credits chosen from other anthropology courses at the 200 level

Third and Fourth Years

30 credits in Anthropology and Sociology, including:

- at least three credits from courses in each of the following areas:
 - 1) evolution and cultural ecology (ANTH 318, 319, 320, 321, 322, 323, 325, 411, 420, 422, 460)
 - 2) the anthropology of knowledge and power (ANTH 300, 312, 316, 331, 332, 333, 341, 413, 415, 417)
 - 3) the practice of anthropology (ANTH 317, 400, 407, 408, 409, 418, 424, 431, 432)
- six credits from the following ethnographic area courses: ANTH 302-304, 315, 350-353, 401-405
- other courses to be chosen in consultation with a departmental adviser

Also, students majoring in Anthropology **must** at some point in their course of studies take either Linguistics 200 or Anthropology 317, or equivalent.

A course in social statistics such as ANTH 218 is also recommended as part of an anthropology Major program.

Honours:**Admission to Third Year**

- high second-class average in first and second years
- Anthropology 100
- Anthropology 103 and/or 140
- three credits in anthropology courses at the 200 level

Admission or Continuation to Fourth Year

- high second-class average in the first three years and two first-class marks in courses in the major discipline

Third and Fourth Years

36 credits in Anthropology and Sociology, including:

- at least three credits from courses in each of the following areas:
 - 1) evolution and cultural ecology (ANTH 318, 319, 320, 321, 322, 323, 325, 411, 420, 422, 460)
 - 2) the anthropology of knowledge and power (ANTH 300, 312, 316, 331, 332, 333, 341, 413, 415, 417)
 - 3) the practice of anthropology (ANTH 317, 400, 407, 408, 409, 418, 424, 431, 432)
- six credits from the following ethnographic area courses: ANTH 302-304, 315, 350-353, 401-405
- Anthropology 449
- other courses to be chosen in consultation with a departmental adviser

Also, students in the Honours Anthropology Program **must** at some point in their course of studies take either Linguistics 200 or Anthropology 317 or equivalent.

Undergraduate Courses

Anthropology 100, 103, 140, 201, 202, 204, 205, 206, 213, 214, 215, 217, 218, 220, 221, 301, 320, 325, and 329 are general courses open to all students. Anthropology 301 cannot be taken for Major or Honours credit.

Other courses listed in the Courses of Instruction section of the *Calendar* under "Anthropology" are intended primarily for students in the Major and Honours programs. Except for Anthropology 449, these are open to non-majors and students in the General B.A. Program with appropriate prerequisites or permission of the instructor.

Anthropology 100 is a prerequisite to all courses in the Department except those described above as "general", unless specific permission of a departmental adviser is obtained.

Native Peoples

Students who want to concentrate in the study of Native peoples and cultures may choose from among the following courses beginning in the second year:

Anthropology (ANTH)

- 220 Native Peoples of British Columbia: Cultures and Resources
- 221 Native Peoples of British Columbia: Art and Myth
- 301 Contemporary Native Peoples of British Columbia
- 304 Ethnography of the Northwest Coast
- 321 The Canadian Far West in Prehistory
- 329 Native Peoples of Canada
- 401 Native Peoples of North America
- 411 Prehistory of a Special Area in the New World
- 420 Archaeology of British Columbia

The following courses also regularly include material relating to native cultures:

- Anthropology 331, 332, 341, 407, 408, and 424
- Fine Arts 261, 369, and 469
- History 302, 427 and 475

Each May the Department issues a pamphlet to inform students in detail about courses that will be offered the following September. Students should obtain a copy before choosing courses.

Archaeology

Students may emphasize archaeology both at the undergraduate and graduate levels by selecting courses offered in a number of departments at the University of British Columbia, especially the Departments of Anthropology and Sociology, Classics, Fine Arts, and Religious Studies. In each case, a Major or Honours program can be developed with an emphasis on archaeology. The University is strong in areas complementary to archaeology, such as ethnology, ecology, geography, geology, metallurgy, biology, and quantitative methods; and students are urged to begin courses in these fields at an early date. They are encouraged to acquire a broad knowledge of different geographical areas, techniques, and theories. Several possibilities are listed below under "Courses" and "Courses Which are Ancillary to Archaeology".

Within the Department of Anthropology and Sociology, the focus is on anthropological archaeology, cultural ecology, the economic patterns of hunters and gatherers and agriculturalists, and the nature of complex societies. Instruction covers field techniques, analysis, and the study of various culture areas (such as Western North America, Mesoamerica, Oceania, and East and South-east Asia) and

includes a local field school and training in computer applications. The Museum of Anthropology offers extensive archaeological facilities and houses collections from various parts of the world.

Classical archaeology in the Department of Classics covers the art and cultural history of the Greek and Roman world from the Bronze Age to the founding of Constantinople. Though primarily descriptive, courses include a certain amount of archaeological material and method, and discussion of relevant social and historical processes. Some attention is paid also to ancillary disciplines such as epigraphy and numismatics. Field experience is acquired through a summer practicum on a Classical site in Europe. There is a small teaching collection in the Museum of Anthropology.

The **Department of Fine Arts** offers a number of courses at the undergraduate and graduate level which depend to a greater or lesser extent on material deriving from archaeological work. Although these courses are not concerned with archaeological techniques as such, they may be of great value to the student as suggesting some of the ways in which archaeological findings contribute to the history of art, particularly in Asian Art, Medieval Art in Western Europe, and the Indigenous Arts of the Americas.

The **Department of Geography** offers courses of value to the archaeologist in a variety of fields. Research on wetland agriculture in Central America has been carried out for several years with student participation. In past years, students have undertaken combined programs with Anthropology in the fields of subsistence and cultural ecology.

The **Department of Geological Sciences** offers several courses that may prove of value to the student of archaeology, particularly in the fields of mineralogy and the analysis of materials.

The **Department of History** offers various courses on cultural history relevant to those working in archaeology. The Department also offers an introductory course in historical archaeology which concentrates on material culture in the period of written records, with an emphasis on North America.

The **Department of Religious Studies** offers courses at the undergraduate level in the archaeology of the ancient Near East (including Egypt), Biblical archaeology, and Islamic art and archaeology.

Courses in **Biology, Botany, and Zoology** which deal with the basic structures and functions of the plants and animals found in archaeological sites are also listed below.

Courses**Anthropology (ANTH)**

- 103 Introduction to Anthropological Archaeology
- 204 Introduction to Classical Archaeology (also listed as Classical Studies 204)
- 205 Introduction to Historical Archaeology (also listed as History 205)
- 305 Theory in Archaeology
- 306 Summer Field Training in Archaeology
- 318 Old World Palaeolithic Archaeology
- 319 The Emergence of Old World Civilizations
- 321 The Canadian Far West in Prehistory
- 322 Archaeological Foundations of East and Southeast Asian Civilizations
- 323 Archaeological Foundations of New World Civilizations
- 406 Analytical Techniques in Archaeology
- 410 Prehistory of a Special Area in Asia or Oceania

- 411 Prehistory of a Special Area in the New World
- 420 Archaeology of British Columbia
- 424 Applied Archaeology
- 517 Archaeological Methods
- 520 Advanced Prehistory

Classical Studies (CLST)

- 204 Introduction to Classical Archaeology (also listed as Anthropology 204)
- 330 Greek and Roman Art (also listed as Fine Arts 329)
- 335 Summer Practicum in Classical Archaeology
- 429 Studies in the Art and Archaeology of Greece and Rome (also listed as Fine Arts 429)
- 430 Topography and Monuments of Ancient Athens
- 431 Topography and Monuments of Ancient Rome
- 501 Topography and Monuments of Athens
- 502 Topography and Monuments of Rome
- 503 Studies in Greek Architecture
- 504 Studies in Roman Architecture
- 505 Studies in Greek Town Planning
- 506 Studies in Roman Town Planning
- 508 Studies in Roman Painting and Mosaics
- 509 Studies in Greek Sculpture
- 510 Studies in Roman Sculpture
- 511 Studies in Greek Regional Archaeology
- 512 Studies in Roman Provincial Archaeology
- 513 The Archaeology of Greek and Roman Technology
- 514 Greek and Roman Minor Arts
- 518 Topics in Greek Archaeology
- 519 Topics in Roman Archaeology

History (HIST)

- 205 Introduction to Historical Archaeology

Religious Studies (RELG)

- 300 Archaeology of the Ancient Near East (also listed as Fine Arts 327)
- 306 Archaeology and the Bible
- 341 Islamic Art and Archaeology (also listed as Fine Arts 359)

Courses Which are Ancillary to Archaeology**Anthropology (ANTH)**

- 140 Introduction to the Study of Human Evolution
- 325 Introduction to Physical Anthropology
- 425 Behaviour and Social Relations in Non-Human Primates
- 426 Anthropometry and Osteometry
- 431 The Care of Cultural Property
- 460 Cultural Ecology and Cultural Evolution

Biology (BIOL)

- 101 Principles of Biology (or 102 or 103)
- 204 Comparative Vertebrate Zoology
- 205 Comparative Invertebrate Zoology
- 209 Non-Vascular plants
- 210 Vascular Plants
- 324 Introduction to Seed Plant Taxonomy
- 343 Plants and Peoples
- 412 Phytogeography
- 421 Paleobotany
- 422 Palynology

Fine Arts (FINA)

- 251 Aspects of Asian Art
- 261 Native Arts of the Americas
- 331 Early Medieval Art
- 333 Architecture of the High Middle Ages

- 351 History of Early Chinese Art
- 353 Buddhist Art of Japan
- 357 Early South and Southeast Asian Art
- 363 Arts of the Aztecs and their Predecessors
- 365 Dynastic Arts of the Classic Maya
- 369 North American Indian Art

Geography (GEOG)

- 101 Introduction to Physical Geography
- 207 Geography of Ecosystems
- 308 Quaternary and Applied Geomorphology
- 315 Environmental Inventory and Classification
- 317 The Physical Environment of British Columbia
- 318 Environmental Change and Quality
- 329 Introduction to Political Geography
- 370 Introduction to Geographic Information and Its Analysis
- 372 Cartography
- 373 Introductory Remote Sensing
- 472 Advanced Geographic Information Systems
- 495 Selected Latin American Habitats

Geological Sciences (GEOL)

- 100 Introduction to the Earth
- 200 Introductory Mineralogy
- 202 Introductory Petrology
- 205 Geological Time
- 256 Stratigraphy and Sedimentology
- 301 Sedimentology
- 312 Environmental Geology
- 421 Paleontology

Arts One

Students entering the first year may enrol in Arts One, an 18-credit program of liberal education. Arts One is organized in teaching groups, each consisting of a maximum of 100 students and five faculty from various University departments, who address themselves to a year's study of themes of basic human concern. The aim of the curriculum is to provide a coherent focus for the student's attention throughout the year. The impact of the program, made possible by the ratio of faculty to students, comes through weekly lectures, seminars, tutorials, and individual conferences. A sense of membership in a community of learners is created through use of the Arts One Building, located near the centre of the campus.

For the students enrolled, Arts One satisfies the Faculty of Arts requirement for first-year English and the departmental requirements for first-year History and Philosophy.

On successful completion of Arts One and two regular courses (twelve credits), students receive second-year standing in the University. Owing to the nature of the course, supplemental examinations will not be given in Arts One.

Students who enrol in Arts One are expected to remain in the program for the complete session, but they may drop it without penalty during the period officially allowed for course changes.

Information about Arts One and appointments for counselling concerning the program can be obtained from the Secretary, Arts One; telephone (604) 822-3430. Registration for Arts One is accomplished in the same way as registration in other courses in the Faculty of Arts.

Arts Studies

The Faculty of Arts offers special topics and interdisciplinary courses for upper-division students in the Faculty of Arts, and two second-year level courses in the UBC-Ritsumeikan Joint Program.

Distinguished Visitors (ASTU 401) (3-6) – Special topics course offered by distinguished visitors in the Faculty of Arts. Topics announced annually

Interdisciplinary Studies in Arts (ASTU 400) – The Faculty of Arts offers interdisciplinary courses taught by faculty from two or more Departments. These courses appear cross-listed under the relevant Departments. Topics announced annually.

UBC-Ritsumeikan Joint Program (ASTU 201, ASTU 202) These two courses explore the relations between, and compare facets of, Canadian and Japanese societies. Offered as part of a joint academic program with Ritsumeikan University in Kyoto, they are taught jointly by UBC and Ritsumeikan faculty, and normally include students from both universities.

Description of these courses can be found under Arts Studies (ASTU) in the Courses of Instruction section of the *Calendar*. Further details are available from the relevant Departments, from the Director of the UBC-Ritsumeikan Joint Program (UBC-Ritsumeikan House), and from the Senior Faculty Adviser's Office (Buchanan A207).

Asian Area Studies

See Asian Studies.

Asian Studies

The Department of Asian Studies offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

The courses offered at the undergraduate level fall into two categories:

- 1) courses on the contemporary and historical cultures of South, Southeast, and East Asia, which do not require knowledge of an Asian language (these are listed under the heading Asian Studies); and
- 2) courses in language, including advanced reading courses, which introduce the student to literary, philosophical, and historical works in their original language (these courses are listed under the specific language headings).

Courses in category 1) are open to all students in the Faculty of Arts. Courses in category 2) are designed to provide the essential training for those who wish to proceed to further scholarly studies in the field of Asian Studies at the graduate level. However, in the more elementary courses, language training at the appropriate level is also provided for those who wish to obtain some knowledge of Chinese, Indonesian, Japanese, Korean, or South Asian languages (Hindi, Punjabi, Sanskrit, Urdu) as part of their general education or with a view to later practical use.

The Department offers Honours and Major programs in Chinese, Japanese, and South Asian Languages, and, in cooperation with other departments, a Major program in Asian Area Studies which requires less language study.

Study of the necessary languages should begin as early as possible in a student's academic career. A good foundation in language studies is a prerequisite for admission to graduate studies. Those who do not have the necessary preparation when they apply will be asked to make up this

deficiency. Credit is not normally given to graduate students for such preparatory work.

Requirements for the B.A. Degree**Major:
Asian Area Studies****Area of Specialization**

Each Asian Area Studies major should choose a regional specialization within Asia: East Asia, South Asia, or Southeast Asia. Within the East Asia specialization, three sub-specializations are possible: China, Japan, and Korea.

Students who intend to do graduate work specializing in the Asian field are encouraged to take at least 18 credits in a single discipline (e.g., History, Political Science, Geography, Anthropology).

First and Second Years

Students anticipating a major in Asian Area Studies must complete the following 18 credits of prerequisites:

- 1) a six-credit introduction to the civilization of the area of specialization (Asian Studies 105 for East Asia, Asian Studies 115 for South Asia; Asian Studies 206 for Southeast Asia).
- 2) 12 credits of instruction in one of the languages of the area (Chinese, Japanese, or Korean for East Asia; Hindi, Punjabi, or Sanskrit for South Asia; Indonesian for Southeast Asia).

While students are urged to take the 12 credits of language during the first two years, upper-year credit will still be given if they take it later; that is, Asian Area Studies majors may take 100- and 200-level Asian language courses as part of their required 48 credits of upper-level Arts courses.

Students having no prior background in the language must take one of the following sequences:

- Chinese 100 and 101, or Chinese 180
- Hindi 102 and 200, or Hindi 110 plus three credits from among Hindi 405, Hindi 410, Urdu 401
- Indonesian 102 and 200
- Japanese 100 and 101, or Japanese 102 and 103 (001), or Japanese 103 (002) and either 200 or 201, or Japanese 180
- Korean 102 and 200
- Punjabi 102 and 200
- Sanskrit 102 and 200

Students having prior background in an Asian language may be required to take 12 credits of upper-level work in the language.

First- and second-year students are also encouraged to take other relevant 100- and 200-level courses such as: Anthropology 100, Economics 100, Fine Arts 251, History 125, 270, Religious Studies 204.

Third and Fourth Years

The major in Asian Area Studies requires 30 credits of upper-level (300- and 400-level) courses in the third and fourth years. These 30 credits should be in courses related to the area of specialization: East Asia, South Asia, or Southeast Asia. Lists of courses approved for each area are given below, divided into the following three categories:

- 1) humanities (art, language at the advanced level, literature, music, philosophy, religion)
- 2) history
- 3) social sciences (anthropology, economics, geography, political science, sociology)

The 30 credits should include at least six credits from each category.

East Asia, Humanities (Equivalents)**Asian Studies (ASIA)**

302	(6)	
324	(3)	
325	(6)	(Philosophy 371)
327	(3)	
335	(6)	
365	(3)	(Religious Studies 365)
366	(3)	(Religious Studies 366)
368	(3)	(Religious Studies 368)
370	(6)*	
375	(6)*	
415	(6)	
417	(6)	(Political Science 424)
435	(6)	

Chinese (CHIN)

courses numbered 200 and above

Fine Arts (FINA)

351	(6)	
352	(6)	
353	(6)	
354	(6)	
356	(6)	
451	(6)	
453	(6)	

Japanese (JAPN)

courses numbered 200 and above

Religious Studies (RELG)

361	(3)	
364	(3)	
367	(3)	
431	(3)	

Theatre (THTR)

340	(6)	
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East Asia, History (Equivalents)**Asian Studies (ASIA)**

320	(6)	(History 382)
321	(6)	(History 381)
322	(6)	(History 386)
330	(6)	(History 383)
370	(6)	
423	(6)	
450	(6)	(History 482)

History (HIST)

380	(6)	(Asian Studies 380)
422	(6)	(Asian Studies 422)
480	(6)	(Asian Studies 480)

East Asia, Social Sciences (Equivalents)**Anthropology (ANTH)**

315	(3/6)	
322	(3)	
352	(3)	
402	(3/6)	
410	(3/6)	(by permission)*
416	(3/6)	

Asian Studies (ASIA)

405	(6)	
417	(6)	(Political Science 424)

Economics (ECON)

341	(3)	
342	(3)	
343	(3)	
444	(3)	

Geography (GEOG)

380	(3)	
425	(3)	
481	(3)	
485	(3)	

Political Science (POLI)

321	(3/6)	
322	(3/6)	
365	(3/6)	

* Only when the area covered in the course is East Asia, will the Department of Asian Studies grant permission to take the course as part of the (East) Asian Area Studies Major program.

South Asia, Humanities**Asian Languages (ASLA)**

300	(6)*	
400	(6)*	

Asian Studies (ASIA)

345	(6)	
347	(6)	
350	(6)	
355	(6)	(Philosophy 372)
360	(6)	(History 389, Religious Studies 358)
370	(6)*	
375	(6)*	
445	(6)	
447	(3)	

Fine Arts (FINA)

357	(6)	
358	(6)	
455	(6)	

Hindi (HIND)

405	(6)	
410	(6)	

South Asian Languages (SOAL)

440	(6-18)	
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Religious Studies (RELG)

354	(6)	
364	(3)	
431	(3)	
452	(6)	

Sanskrit (SANS)

300	(6)	
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Theatre (THTR)

340	(6)*	
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Urdu (URDU)

401	(6)	
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South Asia, History (Equivalents)**Asian Studies (ASIA)**

340	(6)	(History 384)
355	(6)	(Philosophy 355)
360	(6)	(History 389, Religious Studies 358)
420	(6)	
438	(3)	

History (HIST)

385	(6)	(Asian Studies 385)
387	(3)	(Asian Studies 387)
388	(3)	(Asian Studies 388)

South Asia, Social Sciences**Anthropology (ANTH)**

302	(3/6)	
403-5	(3/6)	(by permission)*

Asian Studies (ASIA)

450	(6)	(History 482)
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Geography (GEOG)

380	(3)	
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Political Science (POLI)

323	(3/6)	
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* Only when the area covered in the course is South Asia, will the Department of Asian Studies grant permission to take the course as a part of the (South) Asian Area Studies Major program.

Southeast Asia, Humanities**Asian Studies (ASIA)**

362	(6)	
370	(6)*	
375	(6)*	

Fine Arts (FINA)

357	(6)	
358	(6)	

South East Asian Languages (SEAL)

440	(3-18)	
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Theatre (THTR)

340	(6)*	
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Southeast Asia, History (Equivalents)**Asian Studies (ASIA)**

362	(6)	
450	(6)	(History 482)

History (HIST)

434	(6)	(Asian Studies 434)
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Southeast Asia, Social Sciences**Anthropology (ANTH)**

303	(3/6)	(by permission)*
322	(3)	
403-5	(3/6)	(by permission)*
410	(3/6)	(by permission)*

Asian Studies (ASIA)

450	(6)	(History 482)
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Economics (ECON)

341	(3)	
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Geography (GEOG)

380	(3)	
468	(3)	
484	(3)	

Political Science (POLI)

324	(3/6)	
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* Only when the area covered in the course is Southeast Asia, will the Department of Asian Studies grant permission to take the course as a part of the (Southeast) Asian Area Studies Major program.

Additional courses should be chosen in consultation with an adviser; at least 12 credits must be outside the Asian field.

Major: Chinese

First and Second Years

- Chinese 100, 101, and 200, and either 201 or 301
- Asian Studies 105 is recommended.

(Chinese 180 is equivalent to Chinese 100-101 and 280 to 200-201.)

Third and Fourth Years

- 18 to 24 credits in courses in Chinese numbered 300 or above, which must include Chinese 300/305, 301 (if not already taken in the first two years), and a 400-level course
- 6 to 12 credits in Asian Studies courses on China numbered 300 or above

Major: Japanese

First and Second Years

- Japanese 100 and 101, or 102 and 103, and 200 and 201
- Asian Studies 105 and 225 are recommended

(Japanese 180 is equivalent to Japanese 100-101 or 102-103, and Japanese 280 to 200-201.)

Third and Fourth Years

- 18 to 24 credits in Japanese courses numbered 300 or above, including at least one 400-level course
- 6 to 12 credits in Asian Studies courses on Japan numbered 300 or above

A Double Major in Chinese and Japanese is possible, but will probably require more than four years. Students interested in a Double Major should seek departmental advice at an early stage.

Major: South Asian Languages

First and Second Years

- a total of 18 credits in lower level (100-200) South Asian language courses, including 12 credits in one language from among Hindi, Punjabi, and Sanskrit, and six credits in another. (Hindi 102 and 110 may not both be taken. Students with previous knowledge of any of the three languages must consult a Department adviser for placement.)
- Asian Studies 115 is recommended.

Third and Fourth Years

- 18 to 24 credits in South Asian language courses, including 12 credits in one language from among Hindi, Punjabi, and Sanskrit, and six credits in another. At least 12 of these credits must be in courses numbered 300 or above
- 6 to 12 credits in Asian Studies courses on South Asia numbered 300 or above

Honours: Chinese (Japanese)

First and Second Years

- as for Major in Chinese (Japanese), with at least a 76% average
- Asian Studies 105 and 225 are recommended.

Third and Fourth Years

- 36 credits in Chinese (Japanese) numbered 300 or above (including 342 and 442)
- 24 credits from Asian Studies courses selected in consultation with the Department
- 12 credits outside the Asian field

In addition to the cross-listed 300- and 400-level courses bearing on China and Japan, the following courses will be accepted as Asian Studies courses for Major or Honours programs in Chinese and Japanese, subject to the approval of the Department:

Anthropology (ANTH)

- 303 Ethnography of Special Areas (when the area covered is China or Japan)
- 322 Archaeological Foundations of East and Southeast Asian Civilizations
- 352 Ethnography of East Asia
- 402 Ethnography of China
- 403-5 Ethnography of Special Areas (when the area covered is Japan)
- 410 Prehistory of a Special Area (when the area covered is China or Japan)
- 416 Ethnography of Japan

Economics (ECON)

- 341 Economic Development of Asia
- 342 The Economy of China since 1949

Fine Arts (FINA)

- 351 History of Early Chinese Art
- 352 History of Chinese Painting
- 353 Buddhist Art of Japan
- 354 Japanese Painting Traditions
- 451 Seminar in Chinese Painting
- 453 Seminar in Japanese Art

Geography (GEOG)

- 380 Introduction to the Geography of Monsoon Asia
- 425 Historical Geography of China
- 468 Geography of International Economic Systems
- 481 Geography of Japan
- 485 Geography of China

History (HIST)

- 423 Economic and Business History of Modern Japan

Political Science (POLI)

- 321 Chinese Government and Politics
- 322 Japanese Government and 365 Asian International Relations (when the area covered is China or Japan)
- 421 Advanced Topics in Comparative Politics (Non-Western) (when the area covered is China or Japan)

Religious Studies (RELG)

- 361 The New Religions of Japan
- 364 Buddhism in India and East Asia
- 367 Approaches to Zen
- 431 The Buddhist Religious Tradition

Theatre (THTR)

- 340 History of the Oriental Theatre (when the course deals with China or Japan)

Honours: South Asian Languages

First and Second Year

- as for Major in South Asian Languages, with at least a 76% average
- Asian Studies 115 is recommended

Third and Fourth Years

- 36 credits in South Asian Languages numbered 300 or above.
- 24 credits from Asian Studies courses selected in consultation with the Department.
- 12 credits outside the Asian field.

In addition to the cross-listed 300- and 400-level courses bearing on South Asia, the following courses will be accepted as Asian Studies Courses for a Major or Honours program in South Asian Languages, subject to the approval of the Department:

Anthropology (ANTH)

- 302 (3) Comparative Ethnography of South Asia
- 403 (6) Ethnography of Special Area (when the area covered is South Asia)
- 410 (3) Prehistory of a Special Area (when the area covered is South Asia)

Economics (ANTH)

- 341 (3) Economic Development of Asia

Fine Arts (FINA)

- 357 (6) Early South and Southeast Asian Art
- 358 (6) Later South and Southeast Asian Art
- 455 (6) Seminar in the Art of India and Southeast Asia

Geography (GEOG)

- 380 (3) Introduction to the Geography of Monsoon Asia

Political Science (POLI)

- 323 (6) South Asian Government and Politics

Religious Studies (RELG)

- 364 (3) Buddhism in India and East Asia
- 452 (6) Reading in Hindu Religious Texts

Note: A brochure describing the offerings of the Department of Asian Studies in more detail is available from the Department.

Canadian Studies

The Canadian Studies major program provides an opportunity for contact with the way disciplines in the humanities and social sciences have shaped understanding of Canada. Students in the program will be required to take courses in each of five areas: politics and economics, society, culture, history, and geography. In their fourth year they will enrol in the Senior Seminar in Canadian Studies, to be taught by the distinguished Canadianist holding the Brenda and David McLean Chair in Canadian Studies (in 1995/96 this will be Professor William H. New of the Department of English).

Enrolment is limited to 25 students in each of the third and fourth years. Admission is by application. The program must be approved by a Canadian Studies adviser. For further information consult Dr. Allan Smith, Chair, Canadian Studies Program, Department of History, The University of British Columbia, Vancouver, BC, V6T 1Z1; telephone (604) 822-5193 or 822-2561.

Requirements for the B.A. Degree**Major:****First and Second Years**

- either French 121 (3) (Contemporary French Language) and French 123 (3) (Contemporary French Language and Literature II), or French 122 (3) (Contemporary French Language and Literature I) and French 123 (3) (Contemporary French Language and Literature II). Students intending to meet more than the minimum program requirements in French are advised to complete French 222 (3) (Studies in French Language and Style I) and French 223 (3) (Studies in French Language and Style II).
- either Economics 100 (6) (Principles of Economics) or Political Science 200 (3) (The Government of Canada).¹
- six credits from the following courses:

Anthropology (ANTH)

201 (3/6)	Ethnic Relations
220 (3)	Native Peoples of British Columbia: Cultures and Resources
221 (3)	Native Peoples of British Columbia: Art and Myth

Economics (ECON)

100 ¹	Principles of Economics
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English (ENGL)

202 (6)	Introduction to Canadian Literature
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Geography (GEOG)

290 (3)	Introduction to the Geography of Canada
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History (HIST)

135 (6)	History of Canada
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Political Science (POLI)

200 ¹	The Government of Canada
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Sociology (SOCL)

100 (6)	Introduction to Sociology
210 (3/6)	Canadian Social Structure - Students planning to take Sociology 310 or 410 must take Sociology 100.

¹ Neither Economics 100 nor Political Science 200 can be used to satisfy more than one of these requirements.

In planning the first and second years students should take into account the prerequisites for the 300- and 400-level courses they intend to take in subsequent years.

Third and Fourth Years

In consultation with a Canadian Studies adviser, students will compose a program which includes:

- Canadian Studies 450 (3) (Senior Seminar in Canadian Studies) – to be given by the McLean Chair in Canadian Studies
- six credits of work in each of the following five areas of study, for a total of 30 credits. In special circumstances, and with the permission of the program chair, other courses may be substituted for those listed.

Culture**English (ENGL)**

420 (3)	Canadian Literary Genres
421 (3)	Canadian Poetry
423 (3/6)	Canadian Drama
424 (3)	Canadian Novel
426 (3-12)	Studies in Canadian Literature

French (FREN)

335 (6)	French Canadian Civilization
403 (6)	Survey of French Canadian Literature in Translation

Fine Arts

343 (6)	Art in Canada
443 (6)	Seminar in Canadian Art

Geography**Geography (GEOG)**

327 (3)	Historical Geography of Canada I: Canada Before 1850
328 (3)	Historical Geography of Canada II: Canada After 1850
499 (3)	Economic and Social Geography of Canada

History**History (HIST)**

302 (6)	History of the Native Peoples of Canada
307 (6)	French North America to 1803
326 (6)	The British North American Colonies, 1749-1873
329 (6)	Canadian Social History
401 (6)	French Canada from the end of the 18th Century to the Present
426 (6)	Twentieth Century Canada
427 (3)	Seminar in Native History of Canada
430 (6)	Canadian External Policy since Confederation
437 (6)	The American Impact on Canada

Society**Anthropology (ANTH)**

329 (6)	Native People of Canada
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Sociology (SOCL)

310 (6)	Canadian Society
410 (3/6)	Special Studies in Canadian Society

Politics and Economics**Political Science (POLI)**

301 (3)	Canadian Political Parties
303 (3)	Federalism in Canada
305 (3)	Canadian Political Ideas
363 (3)	Canadian Foreign Policy
336 (6)	Economic History of Canada

- up to 15 credits from the following courses (if not already taken). The total number of upper division courses in any one discipline may not exceed 12.

Anthropology (ANTH)

301 (3)	Native People of British Columbia: Contemporary Issues
304 (6)	Ethnography of the Northwest Coast
321 (3)	The Canadian Far West in Prehistory
329 (6)	Native People of Canada
331 (3/6)	Anthropology of Art
332 (3/6)	Oral Tradition
333 (3/6)	The Analysis of Myth
420 (3/6)	Archaeology of British Columbia

Economics (ECON)

317 (3)	Poverty and Inequality
336 (6)	Economic History of Canada
345 (6)	Money and Banking
350 (3)	Public Finance Policy Topics

351 (3)	Women in the Economy
355 (3)	International Economics
360 (3)	Labour Economics
361 (3)	Economics of Industrial Relations
365 (3)	Topics in Canadian Industrial Organization and Regulation Policy
370 (3)	Benefit-Cost Analysis and the Economics of Project Evaluation
371 (3)	Economics of the Environment
374 (3)	Land Economics
384 (3)	Economic Analysis of Health Services
450 (3)	Economics of Taxation
456 (3)	International Macroeconomics and Finance
460 (3)	Economics of Labour Markets
461 (3)	Economics of Trade Unions
480 (3)	Transportation

The amount of Canadian content in these courses may vary from year to year. Please check with the instructor.

English (ENGL)

333 (3)	Canadian Criticism and Theory
420 (3)	Canadian Literary Genres
421 (3)	Canadian Poetry
422 (3)	The Long Poem in Canada
423 (3/6)	Canadian Drama
424 (3)	Canadian Novel
425 (3)	Canadian Short Fiction
426 (3-12)	Studies in Canadian Literature
427 (3-12)	Studies in First Nations Writing
429 (3/6)	Backgrounds of Canadian Literature

Family Science (FMSC)

320 (3)	The Contemporary North American Family in Societal Context
340 (3)	Family Financial Management

Fine Arts (FINA)

343 (6)	Art in Canada
348 (6)	The Rise of North American Architecture
369 (6)	North American Indian Art
443 (6)	Seminar in Canadian Art
448 (6)	Seminar in North American Architecture
469 (6)	Seminar in North American Indian Art
330 (3/6)	French-Canadian Literature
335 (6)	French-Canadian Civilization
403 (6)	Survey of French-Canadian Literature in Translation
419 (3/6)	Women's Literature in France and French Canada
422 (3/6)	Women Writers of France and French Canada
430 (3/6)	French-Canadian Literature

Geography (GEOG)

317 (3)	The Physical Environment of British Columbia
327 (3)	Historical Geography of Canada, I: Canada Before 1850
328 (3)	Historical Geography of Canada, II: Canada After 1850
363 (3)	The Geography of Resource Industries
426 (3)	Historical Geography of British Columbia I
428 (3)	Historical Geography of British Columbia II: Research Seminar
450 (3)	Urban Analysis
468 (3)	Geography of International Economic Systems: Canada and the Pacific Basin
499 (3)	Economic and Social Geography of Canada

History (HIST)

302 (6)	History of the Native Peoples of Canada
303 (6)	History of the Canadian West
307 (6)	French North America to 1803
326 (6)	The British North American Colonies, 1749-1873
329 (6)	Canadian Social History
401 (6)	French Canada from the End of the 18th Century to the Present
404 (6)	British Columbia
430 (6)	Canadian External Policy since Confederation
437 (6)	The American Impact on Canada

Linguistics (LING)

433 (3)	Native Languages of North America
434 (3)	Native Languages of Canada
440 (3/6)	Regional Linguistics
445 (3/6)	Sociolinguistics

Political Science (POLI)

301 (3)	Canadian Political Parties
302 (3/6)	Public Administration
303 (3)	Federalism in Canada
304 (3)	British Columbia Government and Politics
305 (3)	Canadian Political Ideas
306 (3)	Local Government and Politics in Canada
307 (3)	Quebec Government and Politics
363 (3/6)	Canadian Foreign Policy
401 (3/6)	Canadian Provincial and Regional Politics
402 (3/6)	Politics of the Canadian Constitutions
403 (3/6)	The Political Economy of Canada
404 (3/6)	Public Policy and its Administration
405 (3/6)	Topics in Canadian Politics

Religious Studies (RELG)

312 (3)	Jews and Judaism in Canada
420 (6)	Religion in Canada

Sociology (SOCL)

310 (6)	Canadian Society
360 (3/6)	Sociology and Natural Resources
361 (6)	Social Inequality
410 (3/6)	Special Studies in Canadian Society
420 (3/6)	Sociology of the Environment
425 (3/6)	Urban Sociology
470 (3/6)	Sociology of Crime and Justice

- at least 12 credits from 300- and 400-level courses not part of this program, chosen in conformity with faculty requirements.

Note: credit value determined by the department offering the course.

Chinese

See Asian Studies.

Classical Studies

The Department of Classics offers Major and Honours programs in Classical Studies.

A knowledge of the Greek or Latin language is not required for any course in Classical Studies. These courses are designed to investigate the life, literature, and thought of the Greek and Roman world. Classical Studies 204, 210, 305, 310, 313, 314, 317, 318, 330, and 331 may be taken by second-year students. The Department of History recog-

nizes Classical Studies 311, 312, 331, 332, 333, and 334 as History courses (although only six credits from this list may be counted toward a Major in History). Six credits in Fine Arts will be given for each of Classical Studies 330 and 429. Classical Studies 310 or six credits of 313, 314, 317 and 318 are acceptable alternatives to English at the 200 level, except for students majoring in Classical Studies. Classical Studies 336 and 337, and Greek 416 may be credited toward a Major or Honours in Philosophy.

Requirements for the B.A. Degree**Major: Classical Studies****Second Year**

- Classical Studies 310 or 330 or 331

Third and Fourth Years

- 30 credits of Classical Studies courses numbered 300 or above (which must include 310, 330, and 331 if not already taken)
- Classical Studies 305 is highly recommended.

Those who wish to concentrate on art/archaeology should take Classical Studies 335, 429, 430, and 431; on literature, Classical Studies 313, 314, 317 and 318; on history, two or more of Classical Studies 332, 333, and 334. Greek or Latin courses numbered 300 or above may be substituted for 12 of the 30 credits of Classical Studies. Majors in Classical Studies may take 12 credits of 100- and 200-level Greek or Latin courses as part of their required 48 credits of upper-level Arts courses. Religious Studies 300 and Philosophy 333 and 343 are accepted within the Classical Studies Major.

Honours: Classical Studies**First and Second Year**

- 12 credits of Classical Studies and/or Latin and/or Greek with at least a 68% average, and the permission of the Department of Classics
- required: Classical Studies 210; Classical Studies 336 and 337, if offered, may replace Classical Studies 210.
- recommended: Classical Studies 310, or 330, or 331. Students are encouraged to take courses in the ancient languages.

Third and Fourth Years

- 48 credits of Classical Studies, which must include Classical Studies 310, 330 and 331 (if not taken earlier); Classical Studies 336 and 337, if offered (may be substituted for Classical Studies 210), and 449.
- Latin or Greek courses numbered 300 or above may be substituted for six of the 48 credits of Classical Studies.
- Students in Honours Classical Studies may take 12 credits of 100- and 200-level Greek or Latin courses as part of their required 60 credits of upper-level Arts Courses.

Classics

The Department of Classics offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the B.A. Degree**Major: Greek**

- Classical Studies 331 (preferably in the second year)
- 30 credits of Greek numbered above 300; for six of these, a course in Latin or in Classical Studies numbered above 300 may be substituted.

Major: Latin

- Classical Studies 331 (preferably in the second year)
- 30 credits of Latin numbered above 300; for six of these, a course in Greek or in Classical Studies numbered above 300 may be substituted.

Honours: Classics**Prerequisites or co-requisites**

- Greek 200, 301
- Latin 200, 301 (Latin 205 may be taken in place of Latin 200 and 301.)
- Classical Studies 331

Third and Fourth Years

- 60 credits in Greek and Latin courses numbered 300 and above, which must include either Latin 425 (composition) or Greek 425 (composition). Students preparing for admission to a graduate program in Classics should take both Greek 425 and Latin 425 (offered in alternate years).

The Department is prepared to arrange Honours programs in collaboration with other departments (e.g., English, French, Hispanic and Italian Studies, Religious Studies).

Note: For information regarding the Major and Honours programs in Classical Studies, please refer to the preceding section, "Classical Studies".

Comparative Literature

The Program in Comparative Literature offers opportunities for interdisciplinary study at the graduate level, leading to the M.A. and Ph.D. degrees. Undergraduates who are interested in preparing for these degrees should acquire competence in at least two languages other than their native language. In addition, comprehensive knowledge of at least one, and preferably two, literatures should be acquired through study in a double Major program or through the Honours program of one of the language departments. While retaining a primary focus in the study of literary texts, the Program also encourages study of interrelationships among literature, the arts, and the social sciences. Students interested in Comparative Literature should consult Professor Thomas Salumets, Chair, telephone (604) 822-5118, for further information, and should obtain from the Department of English a copy of the *Handbook for Graduate Students in Comparative Literature* which provides details of the Program's entrance requirements and degrees.

Creative Writing

The Department of Creative Writing offers programs of study that lead to the degrees of M.F.A. (including inter-departmental programs in cooperation with the Department of Theatre and Film) and B.F.A.

Requirements for the B.F.A. Degree

First and Second Year

- Creative Writing 202 or 301 and the requirements for the first two years of the B.A. program

Admission to courses and the Major or Honours Program

Applicants for Creative Writing 202 and 301 will be admitted if the applicant's submission of 20 to 25 pages of recent original fiction, creative non-fiction, drama, or poetry, or a combination of these, is judged acceptable by the Department.

Students seeking admission to the Major or Honours program in Creative Writing should apply at the end of their second year of university by submitting to the Department a written request accompanied by their creative writing manuscripts. Students who wish to be considered for the Major or Honours program should submit 30-35 pages of original writing in two or more genres. Applicants will be accepted into the Major or Honours programs on the recommendation of the instructors assigned to evaluate their manuscripts.

Students who wish to be considered for a particular 400-level course, but not for a specialization in Creative Writing, should submit 20 to 25 pages of original writing relevant to that course. Applicants for Creative Writing interested in Creative Writing 404, 406, or 407 may submit fiction or plays.

First-year students are not eligible to take a 400-level course.

Major:

Third and Fourth Years

Students must complete 60 credits, 36 of which must be Creative Writing courses numbered 300 or above. The 36 credits will be chosen in consultation with their adviser from Departmental workshops and tutorials, and must include:

- any three of the following workshops (in satisfying the three-genre requirement for the Major, 408 and 409 are treated as a single genre, fiction):

Creative Writing (CRWR)

- 403 Writing of Children's Literature
- 404 Radio Plays and Features
- 405 Creative Forms and Techniques of Non-fiction
- 406 Screen and Television Plays
- 407 Stage Plays
- 408 Novel and Novella or
- 409 Short Story
- 410 Poetry
- 415 Translation
- 416 Applied Creative Non-fiction
- 439 Special Projects in Creative Writing

- One or more of the following tutorials in areas of the student's special interest:

Creative Writing (CRWR)

- 447 Directed Reading
(not necessarily offered every year)
- 491 The Writing of Children's Literature
- 492 Non-fictional Prose
- 493 Radio Plays and Features
- 494 Screen and Television Plays
- 495 Translation
- 496 Poetry
- 497 Fiction
- 498 Stage Plays

Honours:

Third and Fourth Years

The same as the Major, with the difference that students must complete 48 credits in Creative Writing, which will be chosen in consultation with the adviser from the Departmental workshop and tutorials, and include any three of the workshops listed above. As part of the program, Honours students will be required to complete a thesis of a length and form appropriate to the genre. (Requirements for the Honours program are currently under review.)

Double Major:

Students who have completed all the degree requirements for a Double Major in Creative Writing and another subject falling within the B.A. program may choose to graduate with either a B.F.A. or B.A. degree.

Diploma:

Applied Creative Non-fiction

Prerequisite

A Bachelor's degree or equivalent in any discipline, or in the case of mature applicants with considerable professional experience, extensive work in the field of Creative Non-fiction. Candidates for admission must submit at least 30 pages of original material containing samples of writing in Creative Non-fiction and at least one other imaginative form (fiction, poetry, playwriting, etc.).

Course of Study

The program consists of 24 credits of course work:

- Creative Writing 301 or equivalent (comprised of other writing courses or equivalent writing experience);
- Creative Writing 405;
- Creative Writing 416 (405 and 416 may be taken concurrently); and
- Creative Writing 439 and/or 492

Notes

- 1) Successful completion of 301 does not automatically result in acceptance into 405 or 416 due to limited enrolment.
- 2) All requirements for the Diploma must be completed within five years of the initial registration in the program.

Instruction

Instruction is based on the premise that promising student-authors can benefit from professional criticism and the necessity of producing regularly and meeting deadlines. Workshops, conferences and tutorials are designed to focus attention upon the student's own work. Reading assignments may be made in the Department's magazine of current writing, *PRISM International*, and other relevant journals and books. There are no examinations, and marks are based on the writing done and on participation in workshops throughout the year.

Economics

The Department of Economics offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Admission to the Major or Honours Program

Admission to the Major or Honours program in Economics is not automatic. To be admitted students must submit a formal application. Because there are a limited number

of places some students who satisfy the minimum prerequisites may not be admitted.

Selection for admission is based on the average standing in all credits of post-secondary coursework attempted, with the exception of 12 credits which may be excluded from the calculation. The average is calculated on at least 48 credits, including English 100, Economics 100, Mathematics 140 and 141 (or equivalent). Students not admitted to the Major in Economics who are eligible to take Economics 490 may be admitted to the final 30 credits of the program, but only if places become available, which is unlikely.

Students who are considering a Major or Honours program in Economics are strongly encouraged to seek advice on their program from Department advisers upon completion of their first 54 credits (or if possible, on completion of their first 30 credits).

Application

A written application for admission to the Major or Honours program should be received by June 15, prior to registering for the final 60 credits, to ensure that the student will be considered for admission. Application forms are available from the Undergraduate Admissions Secretary, Department of Economics, The University of British Columbia, #997-1873 East Mall, Vancouver, B.C., V6T 1Z1.

The application form must be accompanied by a copy of the student's permanent record from UBC (unless application is post-marked May 20 or earlier) and official transcripts of the student's record from all other post-secondary educational institutions attended.

Requirements for the B.A. Degree

Major:

Prerequisites

To be admitted to the Major program a student must have obtained 54 credits applicable to a B.A. degree, including credit for:

- six credits of first-year English
- Mathematics 140 and 141 (or their equivalent)
- Economics 100
- Economics 201 and 202 (or their equivalent)

Students without Economics 201 and 202 may be considered for admission under certain circumstances.

Requirements

In addition to the prerequisites the program must include:

- Economics 303
- Economics 325 and 326
- one of: Economics 334, 336, 437
- Economics 490
- another six credits* in Economics at the 400-level
- another six credits in Economics at the 300- or 400-level

* Three credits for students pursuing a Double Major in Economics and another subject, for a total credit requirement in Economics of 30 credits. See Double Major Program under the Program Requirements section for the Faculty of Arts.

Mathematics 200 and 221 are recommended but not required.

Students should note the prerequisites for senior courses and plan their programs accordingly. Particular attention should be paid to the prerequisites for Economics 490; Economics 303, 325 and 326 (or their equivalent) must be

successfully completed **before** the student may enrol in Economics 490.

Honours:

Prerequisites

To be admitted to the Honours program a student must have obtained 60 credits applicable to a B.A. degree, with an overall average of 68% or better on all credits attempted, and have completed successfully:

- six credits of first-year English
- Mathematics 140 and 141, or 100 and 101
- Economics 100 with at least a 68% average
- Economics 206 and 306 with at least a 68% average (or, with permission of the Honours adviser, Economics 201 and 202)

Students considering an Honours program in Economics should consult the Department's Honours adviser on completion of their first 60 credits (if possible, on completion of their first 30 credits). Students without Economics 206 and 306 (or their equivalents) may be considered for admission pending satisfactory completion of the required courses.

Requirements

In addition to the prerequisites the program must include:

- Economics 325 and 326
- one of: Economics 334, 336, 437
- Economics 307 with at least a 65% average
- another nine credits in Economics at the 400 level
- another nine credits in Economics at the 300 or 400 level
- Economics 495 and 499

Mathematics 200 and 221 are strongly recommended.

To proceed to the final 30 credits of the Honours program a student must have attained at least a 68% average in all courses taken in Economics.

Courses for Students not Specializing in Economics

Economics 309 is designed for upper-year students who want a survey course in economics but who do not want to specialize in the field. Economics 309 may replace Economics 100 as a prerequisite to other 300- and 400-level courses.

Non-specialists should also note that most 300-level courses have as prerequisites no more than Principles of Economics (Economics 100 or 309).

Students are referred to the Department of Economics *Undergraduate Handbook* for updated information on courses to be offered each session.

English

The Department of English offers programs of study that lead to the degrees of Ph.D., M.A., B.A. The Department offers Honours and Major programs in English with emphasis in either Literature or Language.

In March, the Department circulates its own booklet, *English Courses Offered*, which gives detailed information about the courses to be offered in the next academic year. This booklet states the credit-value of courses listed in the *Calendar* with variable credit. Interested students should write to the Department for a copy of *English Courses Offered*.

Six credits of first-year English or Arts One and third-year standing are prerequisite to all English courses numbered

304 or above except as noted. The designation "(3/6)" means that the Department will offer the course at some times for one term (three credits) and at other times for a full year (six credits). The designation "(3-12)" means that during their complete programs of study, students may take up to 12 credits of work in any course so marked if the specific topic of that course changes from term to term.

Requirements for the B.A. Degree

Major:

Admission

- An average of at least 68% in six credits of 200-level English courses

Second Year

- English 201 (or under special conditions 450 or 210; see *English Courses Offered* for details)

Third and Fourth Years

Students must choose either the Literature Emphasis program or the Language Emphasis program.

- Requirements for the Literature Emphasis program:
 - 1) at least 30 credits in courses numbered 304 and above
 - 2) Of these 30 credits, at least 24 credits must be completed in areas 1 to 9 (listed below).
 - 3) These 24 credits must be distributed to cover five areas, as follows:
 - a) at least three credits in each of three areas chosen from areas 1 to 5, and
 - b) at least three credits in each of two additional areas chosen from areas 1 to 9.
 1. Old and Middle English (includes Chaucer): 340; 341; 350's
 2. Sixteenth Century (includes Shakespeare): 360's
 3. Seventeenth Century (includes Milton): 370's
 4. Eighteenth Century: 380's
 5. Nineteenth Century: 390's
 6. Twentieth-Century British and Anglo-Irish: 400-416
 7. American: 430-437; 439; 460; 461
 8. Canadian and Commonwealth: 420-429; 440; 446
 9. Criticism, Bibliography, and Special Studies*: 310-319; 330-337; 438; 450; 451
 10. English Language and Rhetoric: 304; 306; 307; 308; 320-329
- Requirements for the Language Emphasis program:

At least 30 credits distributed as follows:

 - 1) Six credits of 320 and six credits of 329.
 - 2) 18 credits from among the following courses, with at least three credits from each of at least three of the areas a to d:
 - a) History of English: 340, 341, 350, 351, 352, 353, 355
 - b) Structure of English: 321, 322, 323, 324, 326
 - c) Rhetoric and Composition: 304, 306, 307, 308
 - d) Linguistics: Linguistics 300, 301, 319, 400, 401, 405, 427, 445
(Linguistics 200 is recommended as preparation for English 329.)

* Special studies courses sometimes fit into areas 1 to 8; consult current *English Courses Offered* for area designation of these courses in a given year.

Note: Programs including more than six credits from outside the English department (sub category d) require special approval from the chair of the Major Program and the convenor of the Language Area Group. The requirements for the English Major may be completed through part-time study. Further details are available in *English Courses Offered*.

Honours:

Admission

- at least a 76% average normally in English 201; or at least a 76% average in both English 210 and 211. For admission requirements to English 210 see course listing.

Third and Fourth Years

- at least one course must be taken in each of the following areas; at least two of the courses must be full-year or six-credit courses:

- 1) Language: 306 (6); 308 (3); 320 (6); 321 (3); 322 (3); 324 (3); 325 (3); 326 (3); 329 (6); 340 (3); 341 (3); 345 (3)
- 2) Chaucer: 355 (6); 356 (3)
- 3) Shakespeare: 365 (6); 366 (3-12); 367 (3)
- 4) Milton: 375 (6); 376 (3)

In addition, students are required to take English 491 in their third year, and 492 and 499 in their fourth year. Seventy-two credits are required in the third and fourth years; at least 54 credits in English courses numbered 304 and above and at most 60 credits.

Suggested Courses for Intending Secondary School English Teachers

The English Department, in collaboration with the Faculty of Education, recommends the following courses for majors who wish to prepare themselves to teach English in secondary schools.

Second Year

- English 201 (Major Authors), and either
- English 202 (Canadian Literature) or 203 (Biblical and Classical Backgrounds)

Third and Fourth Years

A total of 36 credits, including

- English 304 (Advanced Composition)
- six credits of English Language (320-329)
- English 365 (Shakespeare)
- English 420 (Canadian Literary Genres) (if not 202)
- six credits of Twentieth-Century British or American Literature (400-416, 430-439; 460; 461)

Also recommended are English 311 (Literature of the Bible) (if not 203), and English 330 (Practical Criticism).

Students in this program must complete all the normal area requirements of an English Major (B.A.), and should also consult the *Calendar* description of the English Concentration and Major in the Faculty of Education.

Environmental Studies

Several Departments in the Faculty of Arts offer courses with an environmental focus. The Department of Geography has identified a group of related courses as an Environmental "stream" within their Major program. Students interested in this program should consult the listings for Geography, in this section of the *Calendar*.

The Faculty also offers a B.A. Honours program in Environmental Studies, designed to give students a broad perspective on the environment. It provides a significant foundation in science, and the social sciences, and through a series of Environmental Studies seminars, brings together students in the B.A. Environmental Studies and B.Sc. Environmental Sciences programs to consider and address environmental problems. Students enrolling in this program require Mathematics 12, Chemistry 11 and Physics 11 and should normally have satisfied the language requirement of the Faculty of Arts.

The Environmental Studies Honours program concentrates on understanding and appreciating the major environmental issues facing human societies rather than on training students in a specific discipline. The program will serve especially those students with a general academic interest in environmental topics. It is not intended as preparation for post-graduate work in a specific discipline (additional qualifying studies may be necessary for further work in some fields); it will, however, provide an excellent preparation for a number of post-baccalaureate environmental and resource management programs offered by other universities.

Enrolment in the second and subsequent years of the program is strictly limited to 24 students in each year and is controlled by stringent academic criteria. Admission to second year will be based on academic performance in first year and will require a minimum 72% average in that year. However, attainment of this minimum average does not guarantee acceptance into the program. Students must maintain at least a 74% cumulative average for continuation after second year. Students who do not meet the required standards for continuation, or who choose to change programs after the second or third year, may seek permission of the Faculty to transfer to the General Arts program. Transfer to a Major program after second year, or to the General Program after third year, may result in some deficiencies in program requirements and a need for additional course work. Applications for entry to the program must be submitted, on forms available from the Political Science Department, to the Environmental Studies Coordinator, Department of Political Science, by May 15 prior to registering for second year.

Requirements for the B.A. Degree

First Year

English 100-level	6
Biology 110 ^{1,2} or 115 ^{1,2} and Biology 120 ¹	6
Economics 100 ³ or Chemistry 103, 110 ³ or (121, 122) ¹	6
Geography 101, or 102 and 103	6
Mathematics 100 ⁴ , 101 ⁴ or 120 ⁴ , 121 ⁴	6
Total	30

Second Year

Literature course	6
Economics 100 ³ or Chemistry 103, 110 ³ or (121, 122) ¹	6
Two of: Geography 200 ³ , 205 ³ , 207	6
Nine credits from:	9
Biology 204 ³ or 205 ³ ; Biology 209 ³ or 210 ³	
Chemistry 201 ³ or 202 ³ ; Physics 140; Political Science 200 ³ ;	
Sociology 210 ³ ; Psychology 202	
Environmental Studies 200 ³	3
Total	30

Third Year

Two of: Economics 201, 370 ³ , 371 ⁴	6
Geography 310 ³ , 315	6
Statistics 200 ³ or 203 ³ or Computer Science 100 or 118	3
Nine credits from:	9
Philosophy 337 ³ ; Political Science 302 ³ ; Sociology 301 ³ ;	
Psychology 321	
Six credits from:	6
Chemistry 301 ³ , 302 ³ ; Microbiology 417 ³ ;	
Oceanography 308 ³ ; Biology 303 ³ ; Soil Science 200 ³	

Environmental Studies 300 ³	3
Electives ²	3
Total	36

Fourth Year

Philosophy 435 ³	3
Environmental Studies 400 ³	6
21 credits from:	21
Economics 471 ³ , 472 ³ ; Geography 318, 410, 423 ³ , 417 ³ ;	
Philosophy 434 ³ ; Political Science 404 ³ ; Sociology 360, 420	
(Up to nine of these credits may be chosen from:	
Law 356 ³ , 358 ³ , 359 ³ , 362 ³ , 388 ³ , 450 ³ , 452 ³ ;	
Occupational Hygiene 401 ³ ; Forestry 202, 387 ³ ;	
Natural Resources Conservation 200 ³ , 330 ³)	
Electives ⁴	6
Total	36

¹ Students who have not met the Faculty of Arts second language requirement might postpone one of these courses to second year and defer the literature requirement to fourth year, when it may be taken in lieu of six credits of electives.

² Students with at least 80% in Biology 12 are not required to take Biology 110 or 115 prior to Biology 120, and may choose a three-credit elective instead.

³ Courses included in both B.A. and B.Sc. programs, although not all required and not necessarily at the same juncture in each program.

⁴ If not taken in first year.

⁵ May include courses from above lists.

⁶ May include courses from above list although no more than 12 credits in any program permitted outside the Faculties of Arts and Science.

Ethnic Studies

Ethnic Studies refers to the study of ethnic groups within Canadian society. Work ordinarily centres on a single ethnic group, on relationships between ethnic groups, or on a comparison of the situations of such groups in Canada and in other countries. Ethnic Studies involve many disciplines (e.g., history, political science, anthropology, sociology, language, literature, health, education) and are carried on in various departments, schools, and faculties of the university. Subjects may vary widely (e.g., from ethnomusicology to nutrition) and are frequently studied on an inter-disciplinary or inter-faculty basis.

Although there is no Department of Ethnic Studies and no formal program leading to a degree in this field, many departments offer courses relevant to Ethnic Studies and related areas. Students who wish to emphasize Ethnic Studies at the undergraduate or graduate level will usually follow a normal degree program in a single department. Such students should consult the Committee on Ethnic Studies for guidance in planning their course-work; they should do so by the end of their second year. The Chair of the Committee is Dr. Richard Menkis (Department of Religious Studies), telephone (604) 822-5825.

Family Science

The School of Family and Nutritional Sciences offers students in the Faculty of Arts the Family Science Major, an academic program in social science leading to the B.A. degree.

Requirements for the B.A. Degree

Major:

First and Second Years

- Family Science 200 and Statistics 203

Third and Fourth Years

- Family Science 420 and 422

- At least 33 additional credits of Family Science courses including:

at least one of: 320, 322, 324, 326, 436

at least one of: 312, 314, 316, 410, 414

at least one of: 338, 340, 342, 440, 442

Film

The Department of Theatre and Film offers programs of study that lead to the degrees of M.A., M.F.A., B.A., and the Diploma in Film Studies.

Requirements for the B.A. Degree

Major: Film

The selection of students for admission to the Film Major program normally takes place during the week after term finishes (end of April, beginning of May). Prospective candidates should contact the Film Division Office concerning admission requirements and to make appointments for interviews.

Second Year

- Film 230

Third Year

- Film 330, 331, 333

Fourth Year

- Film 433, 435, three credits chosen from Film 437 or 439, and three credits chosen from Film 332, 430, or 432.

Diploma: Film Studies

Applicants must have completed a Bachelor's degree in Arts, Science, or Commerce.

The program will take two years of part-time study. Additional courses, above those required, may be taken on an elective basis. No longer than five years should elapse between initial enrolment in the program and attaining the diploma. Thirty-six credits of course work are required as follows:

First Year

- Film 330, 331, 332, 333

Second Year

- Film 430, 432, 433, 435
- three credits chosen from Film 437 or 439

Enrolment in the program will be limited, and preference will be given to students with strong evidence of creative ability, either in film or in one of the other fine arts. Prospective students should enquire at the Film Division Office for audition materials required and for times when materials are evaluated.

Fine Arts

The Department of Fine Arts offers programs of study that lead to the degrees of Ph.D., M.A., M.F.A., B.A., B.A. in Studio Arts, B.F.A., and the Diploma in Art History. These courses of study have one common goal: the development of critical approaches to visual art. They may be pursued for purposes of general education or for professional activity in the fields of art, and the available programs reflect both the areas of focus and the depth of concern. In art history, the Department offers the degrees of B.A. (Major and Honours), M.A. and Ph.D. A Diploma in

Art History is available for students who have a first degree in another discipline and who wish a foundation in art history for their own purposes. The B.F.A. and M.F.A. degrees are offered in studio art; and for those intending to pursue a post-graduate program in secondary education, a B.A. in Studio Arts is available. Depending upon the purposes of the student and the nature of each program, however, the student can give some attention to both art history and studio art. Brochures which introduce art history and studio goals, programs, and courses are available from the Department.

Requirements for the B.A. Degree

Major:

First and Second Years

- any 12 credits in Fine Arts, of which at least six credits must be in art history.

Third and Fourth Years

- 18 credits of Fine Arts courses numbered 300 or above in one of the following three areas:
 - Western art and architecture
 - Indigenous art of the Americas, or
 - Asian art

See the departmental art history brochure and consult with an adviser for courses in these areas.

- 12 additional credits in Fine Arts courses numbered 300 or above which must include at least six credits in indigenous art of the Americas or Asian art courses for students in Western art, or six credits in Western art for students in indigenous art of the Americas or Asian art
- Students, especially those who are contemplating graduate work, should include at least six credits of fourth-year seminar courses in the minimum requirements for the Major. No more than six credits of cross-listed courses offered by other departments, excepting Fine Arts 329, may be counted toward the minimum requirements for the Major.

Honours:

First and Second Years

- any 12 credits in Fine Arts, of which six credits must be in art history and in which first- or second-class standing must be obtained

Third and Fourth Years

- Same requirements as for the Major, with the exception that six credits in art history numbered 300 or above and the Honours Essay (Fine Arts 499) are required in addition, for a total of 42 credits of Fine Arts courses in the third and fourth years.
- A reading knowledge of at least one language other than English, appropriate to the field of study, is strongly recommended.

Requirements for the B.A. in Studio Arts

This program is intended for, but not limited to, students contemplating a post-B.A. professional program in Education.

Major:

First Year

- a minimum of 12 credits in Fine Arts, including Fine Arts 181 and six credits in art history

Second Year

- Fine Arts 281 (three credits) and nine credits from Fine Arts 282-290. For admission to these courses, see note in the Courses of Instruction section.

Third and Fourth Years

Admission to the Major requires at least a 68% grade in each second-year studio art course.

- a minimum of 30 credits in courses numbered 300 and above, including at least 12 credits in art history and 18 credits in studio art courses

A maximum of 12 credits in ARTE (Art Education) courses offered by the Faculty of Education may be substituted for Fine Arts studio art course requirements, and six additional ARTE credits may be credited towards Faculty of Arts requirements. Potential Education students are also advised to choose 18 credits of electives in a single non-Fine Arts discipline (any prerequisites should have been taken in the second year), which should be chosen in anticipation of a second teaching area.

Requirements for the B.F.A. Degree

The program leading to the B.F.A. degree normally consists of four years of study. The first two years are the first two years of the B.A. program. Application to enter the B.F.A. program proper is to be made by March 31 of the student's second year. The number of places available in the program is strictly limited, hence entry into the program is by selection.

Students from Community Colleges intending to enter the B.F.A. program should normally apply to the University at the end of their first year. However, transfer students may be accepted into the B.F.A. in the third year subject to the submission of transcripts showing the completion of courses equivalent to 12 credits from Fine Arts 281-290 (including Fine Arts 281) with at least a 68% grade in each, an assessment of a portfolio of works and, if possible, an interview. Arrangements for this should be made with the Department by March 31. In all cases, admission will depend upon the spaces available and is at the discretion of the faculty. Students who do not maintain at least a 68% average in the B.F.A. courses may not continue in the B.F.A. program.

A brochure concerning the B.F.A. program is available upon request from the Department of Fine Arts.

Prospective candidates may obtain details concerning the principles and procedures governing the selection of students from the Department of Fine Arts.

First Year

Requirements of the first-year B.A. program, including Fine Arts 181 and six credits of art history, with at least a 68% average in each.

Second Year

Requirements of the second-year B.A. program, including Fine Arts 281 (three credits) and nine credits from Fine Arts 282-290, with at least a 68% grade in each. For admission to these courses, see the note in the "Courses of Instruction" section.

Third Year

- 36 credits in courses in the Faculty of Arts including Fine Arts 380 (six credits)
- 12 credits chosen from Fine Arts 381-386, and Fine Arts 339 or 340 or 343 (six credits)

Fourth Year

- 36 credits in courses in the Faculty of Arts including Fine Arts 480 (six credits) and 18 credits chosen from Fine Arts 481-486

- at least 60 of the last 72 credits for the B.F.A. degree in Fine Arts must be in courses numbered 300 or above

Diploma: Art History

Students shall already have a first degree in another discipline. Applications for admission should be made to the Registrar no later than and preferably before August 1 for entry in September.

The Diploma program requires 30 credits of courses in art history numbered 300 or above. No more than six credits of cross-listed courses offered by other departments, excepting Fine Arts 329, may be counted toward the requirements. Fine Arts 373 and 375 are required for all students unless written permission to the contrary is given by the Department. Only six credits of C standing may be credited toward the Diploma requirements.

French

The Department of French offers programs of study that lead to the degrees of Ph.D., M.A., B.A., and the Diploma in Translation.

Requirements for the B.A. Degree

Students wishing to specialize in French will normally choose to concentrate either in literature or in language. Both programs include combinations of general and specialized courses. Other combinations may be approved after discussion of individual needs and interests with departmental advisers.

Major:

French with emphasis on Language

First and Second Years

- French 122 and 123; French 220, 222, 223 (These second year courses may be taken in the third year with permission of the Department.)

Third and Fourth Years

- French 353, 355 and 370
- six credits from French 357, 453, 455, 457
- 15 credits of senior French courses, of which at least nine must be from language courses numbered above 350.

Major:

French with emphasis on Literature

First and Second Years

- French 122 and 123; French 220, 222 and 223 (these second year courses may be taken in the third year with permission of the Department.)

Third and Fourth Years

- French 353 and 355
- 24 credits in courses numbered 300 or above (excluding 340, 400, 403, 422), of which 18 credits must be from literature courses 300, 320 to 321, 330, 407 to 430 (three of these credits must represent literature prior to 1700).

Honours: French with emphasis on Language

First and Second Years

- French 122 and 123; French 220, 222 and 223

Third and Fourth Years

- French 353, 355, 370
- six credits from French 357, 453, 455, 457
- 27 credits of senior French courses, from which at least 21 must be from language courses numbered above 350
- French 499

Honours: French with emphasis on Literature

First and Second Years

- French 122 and 123; French 220, 222 and 223

Third and Fourth Years

- French 300 (6), 353 and 355
- six credits from French 357, 453, 455, 457
- 18 credits of senior French courses, from which at least 12 must be from literature courses 320-321, 330, 407-430 (three of these credits must represent literature prior to 1700)
- French 401, 499

Minor:

First and Second Years

- French 122 and 123; French 220, 222 and 223 (these second-year courses may be taken in the third year with permission of the Department)

Third and Fourth Years

- French 353 and 355
- at least 12 credits (and no more than 18) from the following: French 300-335, 351-370, 407-420, 425-478.

Notes

- 1) French 223 or its equivalent is prerequisite to all French language courses numbered 350 or above. French 220 or its equivalent is prerequisite to all French literature courses numbered 300, 330, 401 and above.
- 2) With the exception of 401, and provided prerequisites have been satisfied, courses numbered 300-478 may be taken in either the third or the fourth year.
- 3) All students with credits for French 12, either from the FSL program or from the Immersion program, are required to take a placement test to determine their best course options. Up to six advanced credits may be allowed for AP, IB or Français 12, subject to satisfactory performance on our placement test.
- 4) A brochure describing each year's offerings of the Department of French in more detail is available from the department.

Change of course numbers

Prior to 1994, the courses in the following list carried the numbers indicated in parentheses: 121 and 122 and 123 (120), 222 and 223 (202), 351 (356), 353 and 355 and 357 (352), 453 (452), 455 (450 and 452), 457 (452), 461 (460), 471 (456).

Diploma: Translation

Prerequisites

A Bachelor's degree or equivalent, or, in the case of mature applicants with professional experience, extensive work in the field of translation. A high level of proficiency is expected in both written and spoken English and French. All candidates must pass the Department's Translation Proficiency Examination which includes précis-writing and translations. Further information on the Examination may be obtained by telephoning (604) 822-2879.

Admission

Only after passing the Translation Proficiency Examination should candidates apply to the Registrar's Office, preferably before August 1, for admission in September.

Course of Study

The program consists of 30 credits of work, normally completed in two years of part-time study.

French

480 (3/6)	Comparative French and English Stylistics
482 (3/6)*	Advanced Translation: French to English (423)
484 (3/6)*	Advanced Translation: English to French (424)
486 (3/6)	Seminar in Advanced Translation (427)
489 (3/6)	Translation Project (429)

* French 482 and 484 are to be taken concurrently.

Note: With the approval of the program adviser, six credits of the above offerings may be replaced by one or more relevant courses offered at the 400 level at UBC. Students should consult the program adviser before registering for courses.

General Program

See Program Requirements.

Geography

The Department of Geography offers programs of study that lead to the degrees of Ph.D., M.A., B.A., M.Sc., B.Sc. See the Faculty of Science section for the B.Sc. and for the Atmospheric Science program, offered cooperatively by the Departments of Geography and Oceanography.

In March, the Department circulates its own booklet, *A Guide to Geography*, which gives detailed information about the programs offered by the Department. It also produces *Geography 3rd and 4th Year Course Guide* and *Geography Graduate Courses*. Interested students should write to the Department for copies.

Requirements for the B.A. Degree

Major:

First and Second Years

- at least six credits from Geography 121, 122, 210, and 290; and at least six credits from Geography 101, 102, 103, 200, 204, 205, and 207

Note: Students intending to major in Geography with an emphasis on environmental studies should take Geography 101 (or 102 and 103), 200 or 204, 205, 207, 210 and six

credits of mathematics. Students intending to emphasize economic or urban geography should take six credits of mathematics.

Third and Fourth Years

Thirty credits of geography courses numbered 300 and above (of which at least three shall be at the 400 level), as follows:

- six credits from Methodology and Techniques courses: Geography 345, 370, 371, 372, 373, 374, 375, 379, 472
- three credits from courses on Major World Regions: Geography 380, 391, 395
- nine credits from courses on Key Themes in Geography: Geography 31x, 32x, 35x, 36x. See Note 1.
- three credits from 400-level seminar courses. Must be taken in the student's fourth year. See Note 2.
- nine additional credits

Notes

- 1) It is recommended that the courses on Key Themes in Geography be chosen from more than one of the four categories. Consult the Course Guide and the Departmental adviser.
- 2) Each year several 400-level courses will be run as limited-enrollment seminars, with priority in registration for Geography Honours and Major students up to August 15. Some of these courses will be offered only in alternate years. For the current year's seminar offerings, please consult the third and fourth year course guide available from the Geography office.

Honours:

First and Second Years

As for Major.

Third and Fourth Years

48 credits of geography courses numbered 300 and above (of which at least nine shall be at the 400 level), as follows:

- nine credits from Methodology and Techniques courses: Geography 345, plus six credits from 370, 371, 372, 373, 374, 375, 379, 472
- three credits from courses on Major World Regions: Geography 380, 391, 395
- nine credits from courses on Key Themes in Geography: Geography 31x, 32x, 35x, 36x
- nine credits from Geography 4th year seminar courses. Must be taken in the student's fourth year. See Note 1 under Major: Third and Fourth Years.
- 18 additional credits

Notes

- 1) Unlike Geography departments in many other universities, the Department does not consider the Honours program the preferred route to graduate study in Geography at UBC. Students hoping to proceed to Graduate Studies should therefore consult a departmental adviser.
- 2) See notes 1 and 2 under Major: Third and Fourth Years.
- 3) The Honours program in Geography differs from the Major in two respects:
 - degree of specialization
 - standing, which must be at least 74% average of all courses taken (for entry and graduation)
- 4) Students who are interested in the Honours program should consult the Department before the end of their second year or at the beginning of their third year. Individual Honours programs require the ap-

approval of the Department. The total number of Honours students may be restricted to match available teaching resources.

Minor:

First and Second Years

As for Major

Third and Fourth Years

18 credits of Geography courses numbered 300 and above as follows:

- three credits from courses on Major World Regions: Geography 380, 391, 395
- six credits from courses on Key Themes in Geography: Geography 31x, 32x, 35x, 36x
- nine additional credits

Note: See notes 1) and 2) under Major: Third and Fourth Years.

Undergraduate Courses

Introductory Courses: 101, 102, 103, 121, 122, 200, 204, 205, 207, 210, 290, URST 200

Major and Honours Seminars: 345, 407, 440, 448

Technique and Field Courses: 309, 370-379, 472

Regional Courses: 380, 390, 391, 395, 481, 484, 485, 493, 494, 495, 499

Cultural-Historical Courses: 321, 327, 328, 329, 422, 423, 425, 426, 428

Courses on Economic Geography: 360, 361, 362, 363, 460, 464, 468

Environmental Courses: 310, 315, 316, 317, 318, 319, 410, 414, 417, 423

Urban Courses: 321, 350, 352, 357, 450, 457, 464

Courses on Canada: 290, 327, 328, 426, 428, 499

Pacific Rim Courses: 380, 395, 425, 468, 481, 484, 485, 494 (regional focus varies: see instructor), 495

Note: The following courses have Science credit: Geography 101, 102, 103, 200, 204, 205, 207, 300-303, 306, 308, 309, 372, 373, 401-408, 449, 472. Several courses in Geography involve field expenses. Students should check with advisers.

Germanic Studies

The Department of Germanic Studies offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the B.A. Degree

Subject to Faculty of Arts regulations governing the B.A. programs, students must satisfy the departmental requirements listed below.

Major: German

First and Second Years

Students choose one of the following sequences depending upon their previous knowledge of the language:

- no previous knowledge: German 100, 200 or 104, 300 or 100, 204
- with German 11 or 12: German 200, 300
- with untutored knowledge: German 110 and 210

Students with secondary-school German or German-language background are required to contact the department and to take a placement test before the beginning of classes.

Third and Fourth Years

- German 300 (unless already taken), 310
- one of German 320/321; one of 350/351; one of 450/451
- nine additional credits from German courses 301-451 (excluding 339, 430, 439, 449).

Minor: German

First and Second Years

As for Major.

Third and Fourth Years

18 credits of senior courses in German (excluding 339, 430, 439, 449).

Honours: German

First and Second Years

As for Major.

Third and Fourth Years

- German 300 (unless already taken), 310
- one of German 320/321; one of 350/351; one of 450/451
- the Honours tutorials 339 and 439
- nine additional credits from German courses 301-451 (excluding German 430)
- students may submit a six-credit Honours essay (German 449) in place of 339 or any other six credits of senior work, aside from required courses
- a course in European history with an emphasis on German-speaking countries. See Honours adviser
- one university-level course in a language other than English or German

Notes

- 1) Courses are offered in German and Scandinavian, the latter including an elementary and an intermediate course in Swedish.
- 2) Literature courses numbered 401 or above are normally given in alternate years. The Department should be consulted as to whether three-credit courses will be given in the first or second term.
- 3) Up to six credits of courses in German literature in translation may be taken towards the Major or Honours degree. Major and Honours students will be encouraged to read the text in German. Alternatively, with the permission of the departmental adviser, one Scandinavian course may count towards the Major or Honours degree.
- 4) Up to three credits of courses in German literature in translation may be taken towards the Minor. Students in the Minor will be encouraged to read the texts in German.

Greek

See Classics.

Hindi

See Asian Studies: South Asian Languages.

Hispanic and Italian Studies

The Department of Hispanic and Italian Studies offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the B.A. Degree

Hispanic Studies

Major: Spanish

First and Second Years

Students with previous knowledge of Spanish should consult a departmental adviser for placement.

All students intending to proceed towards a Major or an Honours degree in the Department should take the sequence of courses in any one of the columns below:

	A	B*	C	D*
Spanish	100	105	110	100
	200	300	205	200, 205
	220	220	220	220

* Students with Sequence B, or with at least an 80% average in Sequence D, proceed to Spanish 400. Spanish 220 is a prerequisite to enter the Major or Honours programs. It may be taken in the third year with permission of the Department, but will not count towards the 30 credits of third- and fourth-year Spanish courses required for the Major or Honours programs.

Third and Fourth Years

- six credits from Spanish 300 or 400
- 18 credits from Spanish 355, 363 and 435
- six credits to choose from Spanish 403-427, 436-444, 457-468, 307, 392 (Portuguese); or Romance Studies 420, 478

Honours: Hispanic Studies

First and Second Years

As for the Major.

Third and Fourth Years

- six credits from Spanish 300 or 400
- 18 credits from Spanish 355, 363 and 435
- 18 credits from Spanish 403-427, 436-444, 457-468, 307, 392 (Portuguese); or Romance Studies 420, 478
- Spanish 449 (6), Honours Essay

Minor: Spanish

First and Second Years

Students with previous knowledge of Spanish should consult a departmental adviser for placement.

Depending on their previous knowledge of Spanish, students must take the sequence of courses in any one of the columns below:

	A	B	C	D*
Spanish	100	105	110	102
	200		205	202

* Courses in Column D are in Portuguese.

Third and Fourth Years

- Spanish 300
- at least six credits from Spanish 355, 363, 435
- at least six credits from Spanish 330, 400-427, 436-444, 457-468, or 307, 392 (Portuguese)

Major: Latin-American Studies

See Latin American Studies.

Italian and Italian Studies

Major: Italian

Students with Italian 11 or 12 should consult a departmental adviser for placement in appropriate language courses.

First and Second Years

- Italian 100, 200 or 101, 201 or 105

Third and Fourth Years

- 30 credits in Italian courses numbered 300 or above, excluding Italian 302 and Italian Studies 330, 421, 431, and 432

Honours: Italian

First and Second Years

- Italian 100, 200 or 101, 201 or 105
- Latin 100 or equivalent is strongly recommended

Third and Fourth Years

- Italian 400, 449
- 36 additional credits in Italian courses numbered 300 or above, excluding Italian 302 and Italian Studies 330, 421, 431, and 432

Major: Italian Studies

First and Second Years

- at least twelve credits of Italian language, or equivalent
- Italian Studies 330 is strongly recommended

Third and Fourth Years

30 credits of 300-level courses from the lists below; at least 12 must be chosen from List A and 12 from List B.

List A

- Italian Studies 310, 421, 431, 432
- Italian 303, 304, 401, 405, 406, 407, 408, 420 (These courses require knowledge of Italian.)

List B

- Classical Studies 332, 333
- Fine Arts 331, 335, 435 (FINA 335 is a prerequisite of FINA 435.)
- History 313
- Music 454, 455 (These courses have as a prerequisite Music 220, 221; they might also be taken with permission of instructor.)

Minor: Italian

First and Second Years

- Italian 100, 200 or 101, 201 or 105

Third and Fourth Years

- Italian 300
- at least six credits from Italian 303 or 304
- at least six credits from Italian 400-420, Italian Studies 310, 432

Romance Studies and Languages

Honours: Romance Studies

First and Second Years

- first- or high second-class standing in the courses taken in Romance Languages
- Latin 100 or equivalent is strongly recommended.

Third and Fourth Years

- 48 credits numbered 300 and above in at least two Romance languages, including a graduating essay

Honours: Romance Languages

The purpose of this program is to enable students to attain a high level of proficiency in two of the major Romance languages (French, Italian, Spanish), and a reading knowledge of a third, together with some linguistic and literary background.

First and Second Years

- First- or high second-class standing in the prerequisite courses for two of the following languages: French (French 122 and 123, 220, 222 and 223) Spanish (Spanish 100, 200 or equivalent: see Sequences A, B, C, D above) Italian (Italian 100, 200 or 101, 201 or 105)
- Linguistics 100 or 200 (those interested in further linguistics studies take 200, others take 100)
- recommended: Latin 100

Third and Fourth Years

- 24 credits from two languages: French 353 and 355, 453 and 455, Italian 300, 400; Spanish 300, 400
- six credits of a third Romance language: French 340 or 341 or 342, Italian 302, Spanish 305, Spanish 444 (Catalan), Portuguese 307
- six credits of Romance Linguistics (Romance Studies 478, French 478 or Linguistics 320)
- 12 credits of literature, six from each major language studied. Students of Italian and Spanish are required to take a survey course in consultation with a Departmental adviser.
- at least six, and up to 12, credits (or 18 when Romance Linguistics not available), chosen from the following: Linguistics 319 (prerequisite 200); Latin 305; French 320, 321, 330, 331, 335, 370, 407-420, 425-441, 461-476; Italian 303, 304, 401-420; Italian Studies 310; Spanish 355, 363, 392, 403-438, 457-468

History

The Department of History offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the B.A. Degree

Major:

First and Second Years

- 12 credits from any of the 100- or 200-level courses in History (which may include Medieval Studies 200), or the equivalent taken in other institutions

Students who intend to major in History are advised to include in their program some of the basic courses in the social sciences, and the appropriate historical surveys of

- 1) literature in the various departments of language,
- 2) thought in the departments of Philosophy, Religious Studies, and Political Science, and
- 3) the arts in the departments of Fine Arts, Music, and Theatre.

Third and Fourth Years

- 30 credits of third- and fourth-year history courses chosen in consultation with a departmental adviser

The following courses outside the Department may be counted toward the Major:

- One of: Classical Studies 311 and/or 312, 331, 332, 333, 334
 One of: Asian Studies 405, 420, 423
 Economics 334, 336, 437
 Geography 327 and 328, 426 and 428
 History of Medicine 400 and 401

A History major may, in order to build a suitable program, obtain special permission from the Department to count a course other than one of those listed above. Students must take six credits of substantially pre-modern history. Courses at the 100 or 200 level may be used to meet this requirement. A list of courses with substantial pre-modern content is available from departmental advisers.

Honours:

First and Second Years

- first- or second-class standing in 12 credits from any of the 100- or 200-level courses in History (which may include Medieval Studies 200), or the equivalent taken in other institutions
- reading knowledge of French or a foreign language

Third Year

- History 321, and 333
- History 322 or 12 credits of courses in History or related areas, chosen in consultation with the Honours adviser
- six credits outside the Department

Fourth Year

- History 421, 433, and 449
- six credits outside the Department
- an oral examination on the graduating essay

Honours: History with International Relations

First and Second Years

- first- or second-class standing in 12 credits from any of the 100- or 200-level courses in History chosen in consultation with an adviser in the International Relations program
- Political Science 260
- prerequisites for courses to be taken in the upper years
- reading knowledge of French or a foreign language

Third Year

- History 321 and 333
- six credits in History
- in consultation with an adviser, 12 credits selected from courses listed in the International Relations Major program under the headings Asian Relations, International Economy and Development, International Security and Peace Studies, and Soviet and Eastern Europe

Fourth Year

- History 421 and 449
- History 430 or 432
- six credits elective
- an oral examination on the graduating essay

Undergraduate Courses in History

Medieval, Renaissance and Reformation History: 101, 313, 370, 372, 413, 470. See also Medieval Studies.

Modern European History: 115, 120, 202, 215, 306, 315, 316, 319, 324, 334, 335, 400, 405, 406, 407, 408, 425, 431, 432, 435, 438, 441, 442

Modern British History: 310, 415, 419, 460

Canadian History: 135, 205, 302, 303, 307, 326, 329, 401, 404, 426, 430, 437, 442, 475 For supporting courses, see Canadian Studies.

American History: 201, 237, 327, 328, 330, 331, 332, 338, 428, 444, 445, 446, 447

Asian History: 170, 171, 270, 271, 380, 381, 382, 383, 384, 385, 386, 387, 388, 422, 423, 434, 480, 486

Latin American History: 250, 351, 352, 353, 354, 450, 451, 452

International and Contemporary History: 125, 402, 403, 442, 448, 475

Majors Courses (For Majors students only): 490

Honours Courses (For Honours students only): 321, 322, 333, 421, 433, 449

Many of the courses classified as national or regional emphasize social themes.

Brochures are available from the Department describing in detail the courses offered each year in History 100-499.

Special Programs in History: Medieval History

A Major program is available for students who wish to concentrate in the history of Medieval Europe. The program consists of 24 credits of Medieval history: History 370 in the third year, History 470 in the fourth year, and History 313 and 372 in either year.

Indonesian

See Asian Studies.

International Relations

The International Relations Major is an interdisciplinary program which is able to admit only a limited number of students each year (approximately 50). Students take designated courses in several different departments, since there is no separate Department of International Relations at UBC.

Students who want to do graduate work in International Relations are advised to consider the special Honours programs in History (with International Relations) and in Political Science (with International Relations) or to make sure they have at least 24 credits of 300- and 400-level courses in one of the core disciplines (Economics, History, Political Science).

Admission to the Major Program

Admission to the Major program in International Relations is not automatic. Students who do not have a sufficiently high average cannot be admitted to the Major.

Admission is based on the average grade obtained for all post-secondary course work attempted, with the exception of 12 credits which may be excluded from the calcu-

lation. The average is calculated on at least 48 credits, including first-year English, History 125 (or 120), and Political Science 260.

Application Procedure

Application forms will be available after January 1 from the International Relations Program Office (Buchanan C382).

Completed applications are due by May 15 prior to registration for third year. They should be handed in to the International Relations Program Office or mailed to International Relations Program, c/o Department of Political Science, C472 - 1866 Main Mall, University of British Columbia, Vancouver, B.C., V6T 1Z1.

Applicants should arrange for transcripts from all postsecondary institutions they have attended, other than UBC, to be mailed to the above address.

Applicants will be notified by June 15 whether they have been accepted, rejected, or put on a waiting list.

Requirements for the B.A. Degree

Note: All courses listed below are six credits unless otherwise indicated.

First and Second Years

- Economics 100
- History 125 (Arts One does **not** satisfy this requirement.)
- Political Science 260 (3)
- 12 credits of one language other than English, in addition to the Faculty of Arts language requirement. The language can be the one used to satisfy the Faculty of Arts requirement carried to a higher level, or it can be an additional language.

While it is advisable to complete all of these requirements prior to the third year, it is permissible to complete some of them in the third year.

Third and Fourth Years

A minimum of 33 credits in International Relations. These 33 credits must include the following:

- Economics 355 (3) (Note: The prerequisite for this course is Economics 100 or 309.)
- History 432.
- one of: Political Science 360 (3/6), 361 (3/6), 362 (3), or 364 (3/6).
- In their fourth year, students must take one of the required International Relations seminars. These are Economics 457 (3), History 402 (3), History 403 (3), the section of Political Science 464 (3) reserved for International Relations majors, or one of the other seminars that may be designated by the Chair of the Program. (A list of designated seminars for the following year will be available from the International Relations Office in the spring.) (Note: These seminars are **not** available to third-year students, and students are **not** permitted to take more than one of these without permission of the Chair of the Program.)
- 18 credits from the lists below. Of these 18 credits, at least either 12 must be from List A or 12 must be from List B. The remaining six credits can be from Lists A, B, or C.

Note: No course can be double-counted, i.e., used to satisfy two requirements (e.g., if Political Science 360 is used to satisfy the Political Science requirement [see above], it cannot be counted as part of these 18 credits).

A. International Diplomacy, Security, and Peace Studies**History (HIST)**

310	British Imperial History
425	War and Society
430	Development of Canadian External Policy Since Confederation
445 (3)	American Foreign Policy, 1870-1945
446 (3)	American Foreign Policy, 1945 to the present
441 (3)	Anti-Semitism and Nation-Building
448 (3)	Diplomacy and Conflict in the Middle East, 1948 to the Present

Political Science (POLI)

360 (3/6)	Strategic Studies
361 (3/6)	International Violence and its Control
362 (3)	The Great Powers and the International System
363 (3/6)	Canadian Foreign Policy
364 (3/6)	International Organization
367 (3/6)	International Relations Theory and the International System
460 (3/6)	Foreign Policy Analysis
461 (3)	Peace and Conflict Studies
462 (3)	International Relations Theory
465 (3)	Public International Law

Sociology (SOCI)

461 (3/6)	Political Sociology
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B. International Economy and Development**Anthropology (ANTH)**

330 (3/6)	Peasants and the Third World
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Asian Studies (ASIA)

420	Contemporary South Asia
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Economics (ECON)

334	Economic History of Modern Europe
341 (3)	Economic Development of Asia
342 (3)	The Economy of China Since 1949
343 (3)	The Economic Development of Modern Japan
387 (3)	The Soviet Economy
440	Economic Development and International Poverty
444 (3)	The Contemporary Japanese Economy
487	Comparative Economic Systems

Geography (GEOG)

468 (3)	Geography of International Economic Systems: Canada and the Pacific Basin
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History (HIST)

423	Economic and Business History of Modern Japan
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Political Science (POLI)

364 (3/6)	International Organization
366 (3)	International Political Economy
463 (3)	International Interdependence

Sociology (SOCI)

301 (3/6)	Sociology of Development and Underdevelopment
462 (3/6)	Social Change

C. Area Studies**• Asia****Anthropology (ANTH)**

315 (3/6) Japanese Culture and Society

Asian Studies (ASIA)405 Communist Movements in Eastern Asia
420 Contemporary South Asia**Geography (GEOG)**380 (3) Introduction to the Geography of Monsoon Asia
481 (3) Geography of Japan
484 (3) Geography of Southeast Asia
485 (3) Geography of China**History (HIST)**380 Modern Chinese History Since 1840
385 History of India Since 1800
422 Modern Japanese History Since 1800
434 History of Southeast Asia Since 1800
480 Economic and Social History of Modern China to 1949
486 (3) Korea in the Twentieth Century**Political Science (POLI)**321 (3/6) Chinese Government and Politics
322 (3/6) Japanese Government and Politics
323 (3/6) South Asian Government and Politics
324 (3/6) Southeast Asian Government and Politics
365 (3/6) Asian International Relations**• Canada and the Americas****Anthropology (ANTH)**

353 (3) Ethnography of Latin America

Geography (GEOG)

395 (3) Introduction to the Geography of the Americas

History (HIST)338 The United States in the 20th Century
351 (3) Family and Community in Latin America
352 (3) Class and Culture in Latin America
353 (3) Politics and Society in Nineteenth Century Latin America
354 (3) Politics and Society in Twentieth Century Latin America
437 The American Impact on Canada
450 (3/6) Selected Topics in Latin American History
451 (3) Selected Topics in the History of Brazil
452 (3) Selected Topics in the History of Mexico**Political Science (POLI)**

320 (3/6) Government and Politics of the United States of America

• Soviet Successor States and Europe**Economics (ECON)**

387 (3) The Soviet Economy

Geography (GEOG)

391 (3) Geography of Europe

493 (3) Geography of Eastern Europe
494 (3) Geography of the Ex-Soviet States**History (HIST)**319 History of Modern Poland
324 History of East Central Europe in the 19th and 20th Centuries
405 Russia Before 1917
435 Communist Movements in Eastern Europe Since 1900
438 History of the Soviet Union**Political Science (POLI)**325 (3) Communist and Post-Communist Politics
326 (3) European Politics: Selected Cases
327 (3) European Integration**Italian**

See Hispanic and Italian Studies.

Italian Studies

See Hispanic and Italian Studies.

Japanese

See Asian Studies.

Korean

See Asian Studies.

Latin

See Classics.

Latin American Studies

Students with an interest in Latin America may elect to pursue either a program in Latin American Studies as a Thematic Option within the General B.A. Program or the interdisciplinary Major program in Latin American Studies.

Requirements for the B.A. Degree**Thematic Option within the General B.A. Program:
Latin American Studies**

Three distinct programs are available for a Thematic Option in Latin American Studies within the General B.A. Program: Latin American Art; Latin American Literature; and Latin American History. Students will normally enter their Thematic Option program after completing their first 60 credits. Before entering the program they are required to complete either History 250, Spanish 330 or Anthropology 202 (when applicable) and 12 credits of Spanish or Portuguese.

Additional courses with Latin American content may be offered in any of the following fields: Anthropology, Fine Arts, Geography, History, Spanish and Portuguese, Political Science, Sociology.

Some courses such as Anthropology 411 or Geography 352 have variable course content. To make sure the content is Latin American in any given year students should consult the appropriate department.

Students interested in the Latin American Studies Thematic Option should contact the General B.A. Office at (604) 822-4067 for further information on the program.

**Major:
Latin American Studies**

This is an interdisciplinary program intended for students wishing to acquire a general knowledge of the language, culture, society, geography and history of Latin America. The program is administered by an interdepartmental committee of faculty members drawn from those participating in teaching the program. Interested students should consult the booklet available from the Department of Hispanic and Italian Studies (604) 822-6884, or the Department of History (604) 822-2561.

First and Second Year.

- Spanish language: Students take the courses in one of the columns below:

	A	B	C	D	E*
Spanish	100	105	110	200	102
	200	300	200 or 205	300	202 (or 307)

* Courses in Column E are in Portuguese.

These courses do not count towards the maximum of 60 credits allowed for the program in Latin American Studies. All students with a previous knowledge of Spanish or Portuguese should consult a program adviser. Students with a knowledge of Spanish may take Portuguese 307.

- Anthropology 202 (6)
- History 250 (6)
- Recommended: Fine Arts 261 (3)

Third and Fourth Years

- Spanish 300 (6). Students for whom this requirement is waived are required to take six additional credits from the list below.
- Between 27 and 42 credits chosen from the list below. At least three credits chosen from the list must be taken in Geography, and six credits in each of Anthropology, Fine Arts, History and courses in literature offered in Spanish or Portuguese.

These courses may not all be offered in any one year. Students should check annual course offerings with the appropriate departments.

Anthropology 323 (3), 353 (3), 403 (3/6), 411 (3)
 Fine Arts 363 (6), 365 (6), 463 (6), 465 (6)
 Geography 395 (3), 495 (3)
 History 351 (3), 352 (3), 353 (3), 354 (3), 450 (3/6), 451 (3), 452 (3)
 Spanish 307 (6), 312 (6), 303 (6), 392 (3/6), 464 (3/6), 467 (3/6), 468 (3/6)

Linguistics

The Department of Linguistics offers programs of study that lead to the degrees of Ph.D., M.A., B.A., and the Diploma in Applied Linguistics.

Requirements for the B.A. Degree**Major:
Linguistics****First and Second Years**

- 12 credits of a language other than English, at University level or equivalent

First Year

- Linguistics 100 is recommended.

Second Year

- Linguistics 200

Third Year

- Linguistics 300, 301, 400, 401

Additional required courses normally taken in the fourth year may be taken with special permission.

Fourth Year

- Linguistics 319, and at least 12 additional credits from senior courses in Linguistics, or in cognate fields with special permission

**Honours:
Linguistics****First and Second Years**

As for Major.

Admission to Third Year

- at least high second-class average in the first and second years
- first-class standing in Linguistics 200

Third Year

- Linguistics 300, 301, 319, 400, 401

Additional required courses normally taken in the fourth year may be taken with special permission.

Fourth Year

- at least 24 additional credits from senior courses in Linguistics, or in cognate fields with special permission

The following courses may be accepted for credit in Linguistics, subject to the approval of the Department:

Anthropology (ANTH)

- 417 Language and Culture
- 512 Language and Culture

Asian Studies (ASIA)

- 503 Problems in the History of the Chinese Language
- 523 Topics in the History and Structure of the Japanese Language

Computer Science (CPSC)

- 503 Computational Linguistics I
- 523 Computational Linguistics II

Education (EDUC)

- 478 Teaching English as a Second Language
- 489 Applied Linguistics for Teachers

English (ENGL)

- 320 History of the English Language
- 322 Stylistic Variation
- 323 Dialectal Variation
- 324 Literary Semantics
- 326 Studies in the English Language
- 329 The Structure of Modern English
- 507 Studies in the History of the English Language
- 508 Studies in the Structure of the English Language

French

- 461 Historical Phonetics and Phonology of French
- 462 Historical Morphology and Syntax of French
- 464 Historical Lexicology of French
- 472 Morphology of the French Language
- 473 Syntactic Description of the French Language

German

- 502 History of the German Language

Italian

- 415 History of the Italian Language
- 515 Topics in Italian Language

Philosophy

- 425 Philosophy of Language: A
- 426 Philosophy of Language: B

Psychology

- 521 Psycholinguistics

Scandinavian

- 501 Old Icelandic

Spanish

- 403 History of the Spanish Language
- 407 Special Aspects of Peninsular and Latin-American Linguistic Areas
- 507-8 Studies in Hispanic Languages

**Major:
Speech Sciences****First and Second Years**

- Mathematics 100, 140
- recommended: one or more of Mathematics 101; Physics 110, 115, 341; Biology 101, 102

First Year

- Linguistics 100 is recommended.

Second Year

- Linguistics 200
- Psychology 201 and 202 or 260

Third and Fourth Years

- Linguistics 300, 310, 316, 317, 350, 400
- Linguistics 301 or 401
- Linguistics 300, 301, 400, and 401 are normally taken in the third year
- at least six additional credits selected from Audiology 400, 402; Psychology 302, 315, 304 or 313

Notes

- 1) Students majoring in Speech Sciences should be aware that Linguistics 301, 319, and 401 are necessary for graduate studies in Linguistics at UBC.
- 2) Students majoring in Speech Sciences should be aware that Psychology 302, 315, 313, 317, and Audiology 402 and 514 are required for admission to the two-year M.Sc. program in Audiology and Speech Sciences at UBC: in addition, Linguistics 301 and 401 are both recommended as preparation for the same program.

**Honours:
Speech Sciences****First and Second Years**

As for the Major.

Admission to Third Year

- at least a high second-class in the first and second years
- first-class standing in Linguistics 200

Third and Fourth Years

- Linguistics 300, 301, 310, 316, 317, 350, 400, 401
- Linguistics 300, 301, 400, and 401 are normally taken in the third year

- three additional credits in Linguistics courses numbered 300 or above
- 12 credits chosen from Audiology 400, 402; Psychology 302, 315, 304, 313

Notes

- 1) Students taking Honours in Speech Sciences should be aware that Linguistics 319 is necessary for graduate studies in Linguistics at UBC.
- 2) Students taking Honours in Speech Sciences should be aware that Psychology 302, 315 and 313 are required for admission to the M.Sc. program in Audiology and Speech Sciences at UBC.

**Diploma:
Applied Linguistics****Requirements**

- 1) Applicants must have completed a Bachelor's degree in Arts or Education. They must have at least a Major or its equivalent in the language with which they are concerned. This program is not designed to provide practical training in any particular language skills.
- 2) The program can be completed in one year of full-time study, but may be taken part-time. It should be finished within a period of five years.
- 3) A variety of programs may be arranged; for example:
 - a) with illustrative material drawn from one or more of the languages covered in the methods courses for language teachers. If the methods courses do not cover the language required by the student, special arrangements may be made under the heading of Education 449 (Supervised Study).
 - b) with emphasis on English as a second language.
 - c) with emphasis on phonetics.
 - d) with emphasis on Speech Science, as preparation for graduate work in Speech Pathology or Audiology.
- 4) The prerequisites are:
 - Linguistics 200 or 420 (or equivalent) for all students. In addition, for those who wish to be language teachers in the B.C. school system: completion of a program of Initial Teacher Education for either elementary or secondary teaching, including courses in the teaching methodology appropriate to the languages to be taught.
- 5) Thirty additional credits of course work will be required to complete the program, at least 18 of which must be in Linguistics.
- 6) At least 12 credits from the following courses (or their equivalents taken as part of the first degree) are compulsory:
 - At least six credits chosen from Linguistics 300/301 or 400/401
 - At least six credits chosen from Linguistics 316, 317, 319, 350, 435, 445
- 7) With the assistance of the Linguistics Department's Diploma adviser and the advisers from other departments or faculties concerned, courses worth a total of 18 credits (including at least six credits in Linguistics) are to be chosen from the list of senior courses in Linguistics and a list of suitable courses in other departments which can be obtained from the Linguistics Department.

Mathematics

The Department of Mathematics offers programs of study that lead to the degrees of Ph.D., M.A., M.Sc., B.A., B.Sc. For information on the Bachelor of Science degree, see the Faculty of Science section of the *Calendar*.

Requirements for the B.A. Degree

Major:

The Department offers a large selection of courses in various areas of pure and applied mathematics which require various levels of mathematical sophistication. B.A. programs combining Mathematics with another subject such as Economics, English, Linguistics, Music, Philosophy, etc., are encouraged. The student is advised to consult a Mathematics Major adviser in order to design a coherent program of study suitable to the student's interests and abilities.

First and Second Years

- Mathematics 100 and 101 (or 120 and 121) (6)
- Mathematics 200 (or 226) (3)
- Mathematics 220* (3)
- Mathematics 221 or 223, and 215* (6)
- Computer Science, either 122, or 124 and 126 (recommended) (3-6)

Third and Fourth Years

- Mathematics courses numbered 300* or above (24)
- Mathematics, Statistics, or Computer Science courses numbered 300 or above (6)

* One of Mathematics 220 or 215 may be delayed until third year. Students obtaining 68% in Mathematics 226 are not required to take Mathematics 220.

Recommendations

- 1) Mathematically able students are encouraged to take the Honours stream Mathematics 120, 121, 223, 226, and 227.
- 2) Computer Science 124 and 126 are highly recommended. Students interested in Computer Science should consider taking Computer Science 216 in the second year.
- 3) In second year, Mathematics 221 should be taken in first term. It is possible to take (with appropriate prerequisites) some of Mathematics 307, 308, 312, 317, 340 and Mathematics/Statistics 302, as well as Mathematics 300, in second term.
- 4) Students interested in pursuing statistics to some depth should take Statistics 200 and Mathematics/Statistics 302 in second year. This will prepare them for more advanced Statistics courses such as Statistics 305, 306, 404, and 405.
- 5) Majors students should consider taking some of Mathematics 300, 320, 322.
- 6) Mathematics 302 and Mathematics 307 are courses which are useful in many areas of mathematics.
- 7) Students interested in operations research should take Mathematics 308, 441, 442, and 443. They are also advised to take Mathematics 303, Statistics 305 and 306, and some advanced Computer Science courses.
- 8) Students interested in teaching are advised to take Mathematics 308, 309, 312, 313, 416.
- 9) Students interested in becoming actuaries can make substantial progress toward this career goal while majoring in mathematics of statistics. These students

should consult the Actuarial advisers in the Mathematics and/or Statistics Departments for detailed guidance on course selection and advice on taking the Society of Actuaries' examinations.

- 10) Students interested in the physical sciences should take Mathematics 317.
- 11) Students interested in Economics should consider taking Economics 420 and 421, and should consult an adviser in the Economics Department for other appropriate Economics courses.
- 12) In selecting electives, students should consider pursuing an area of application of mathematics in some depth. They should also ensure that they fulfill all the graduation requirements of their Faculty.

Honours:

First and Second Years

- Mathematics 120 and 121 (or 100 and 101)
- Mathematics 220
- Mathematics 223 (or 221) and 215
- Mathematics 226 or 200
- Mathematics 227 or 317
- Computer Science, either 122 or 124 and 126 (recommended)
- Physics 101/102 or 121/122 and Physics 200 or 206 (recommended)

(Students obtaining a 68% in Mathematics 226 are not required to take Mathematics 220.)

Third and Fourth Years

- Mathematics 300, 320, 321, 322, 323 (15 credits)*
- 15 additional credits* from Mathematics 400-403, 416-429, 440, 449. (Mathematics 449 is highly recommended.)
- nine additional credits of Mathematics courses numbered 300 or above

* A 68% overall average is required in these 30 credits to obtain an Honours degree.

Students intending to enter the Honours program should consult a Mathematics Honours adviser at the beginning of the second year. To be admitted to the Honours program, a student must obtain at least 68% in Mathematics 121, or 80% in Mathematics 101 and 80% average in Mathematics 100/101. To continue in the Honours program a student must obtain an overall 68% average. Students who intend to do graduate work in Mathematics should continue their study of French, German, or Russian, beyond the level which fulfils the language requirement of the Faculty of Arts.

Special Honours Program: Mathematics and Another Subject

First and Second Years

- Mathematics: as in Honours Mathematics
- other subject: as specified by the other department

Third and Fourth Years

- Mathematics 320 and 321 (6)*
- nine credits* chosen from Mathematics 300, 301, 316, 322, 323, 331
- 12 credits* chosen from Mathematics 400-403, 416-429, 440, 449
- other subjects as specified by the other department

* A 68% overall average is required in these 27 credits to obtain an Honours degree in Mathematics.

Medieval Studies

Students intending to specialize in Medieval Studies may do so either by taking an interdisciplinary Major program in Medieval Studies, or by completing a Major program in a particular department of the Faculty of Arts, with outside electives taken from the courses listed below. (For permission to arrange this program consult the Medieval Studies adviser.) The prerequisite for the interdisciplinary program is six credits selected from: History 101, Medieval Studies 200, or Classical Studies 100. Other first- and second-year courses applicable to this program are: Classical Studies 210/Philosophy 210, Music 120, and Religious Studies 202. Students should also develop the appropriate language skills as soon as possible.

For further guidance on the Major program and individual course offerings, the Committee for Medieval Studies prepares an annual brochure which is available from the Departments of Classics, French, Hispanic and Italian Studies, English, and History. Students should consult with the departments offering these courses and plan their third and fourth years at the same time, as not every course is offered every year.

The following are courses in Medieval Studies offered in the Faculty of Arts: (All courses are six credits unless otherwise indicated.)

Asian Studies (ASIA)

340	History of Indian Civilization to 1526 (same as History 384)
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Classical Studies (CLST)

331	Ancient History
333	The Roman Empire (Prerequisite: Classical Studies 331 or permission)
336 (3)	Greek Philosophy and Literature from Homer to Sophocles (Recommended Prerequisite: Classical Studies 210)
337 (3)	Greek Philosophy and Literature in the Sophists, Plato and Aristotle (Recommended Prerequisite: Classical Studies 336)
431 (3)	Topography and Monuments of Ancient Rome

English (ENGL)

311	Literature of the Bible
320	History of the English Language
340 (3)	Introduction to Old English
341	Old English Poetry (Prerequisite: English 340)
350	A Survey of Middle-English Literature excluding Chaucer
351 (3/6)	Studies in Middle-English Literature
352 (3)	Middle English
353 (3)	Early English Drama
355 (3/6)	Chaucer

Fine Arts (FINA)

331	Early Medieval Art (same as Religious Studies 326)
333	Architecture of the High Middle Ages (same as Religious Studies 327)
335	Art of the Italian Renaissance from Giotto to Michelangelo
431	Seminar in Early Medieval Art
433	Seminar in Medieval Art
435	Seminar in Fifteenth- and Sixteenth-Century Art

French (FREN)

407	(3/6)	Medieval French Literature
461	(3)	Historical Phonetics and Phonology of French (Prerequisites: French 351 and 370)
462		Historical Morphology and Syntax of French (Prerequisite: French 370)
464	(3)	Historical Lexicology of French (Prerequisite: French 370)
465	(3)	Introduction to Old French

German (GERM)

450		German Literature of the Middle Ages
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History (HIST)

313		The Renaissance
370		Social History of Medieval Europe
372		Ideas and Institutions of the Middle Ages
387	(3)	Medieval India
470		Seminar in Medieval History

Italian (ITAL)

401	(3/6)	Italian Literature of the Middle Ages
405	(3/6)	Topics in the Literature of the Italian Renaissance
415	(3/6)	History of the Italian Language

Italian Studies (ITST)

310	(3/6)	The Divine Comedy in Translation
431		Literature of the Italian Renaissance in Translation

Latin (LATN)

305		Medieval Latin (Prerequisite: Latin 200 or 300)
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Linguistics (LING)

320	(3/6)	Romance Linguistics
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Medieval Studies (MDVL)

440		Medieval Seminar
449	(3/6)	Graduating Essay or Supervised Study

Music (MUSC)

327		Liturgical Music I (Prerequisite: Music 121 (3/6))
350		Early Christian and Medieval Music (Prerequisite: Music 121 (3/6))
352		Late Medieval and Early Renaissance Music (Prerequisite: Music 121 (3))

Philosophy (PHIL)

310	(3)	Ancient Philosophy—A
311	(3)	Ancient Philosophy—B
312	(3)	Medieval Philosophy—A
313	(3)	Medieval Philosophy—B
412	(3)	Topics in Medieval Philosophy

Religious Studies (RELG)

315		History of Christian Thought
321		Prophetic Figures in the Christian Tradition
341		Islamic Art and Archaeology (same as Fine Arts 359)
408	(3)	Topics in Medieval Judaism
448	(3)	Seminar in the History of the Religion of Islam
449	(3)	Seminar in the History of Muslim-Christian Relations

Scandinavian (SCAN)

501	(3)	Old Icelandic
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Spanish (SPAN)

403		History of the Spanish Language
407	(3/6)	Special Aspects of the Peninsular and Latin American Linguistic Areas
427	(3/6)	Selected Topics in Medieval Literature
435		Survey of Spanish Literature from its Origins to 1700 (Prerequisite: Spanish 300)

Modern European Studies

Modern European Studies is an interdepartmental program. It is administered by the following language and literature departments: French, Germanic Studies, Hispanic and Italian Studies, Russian and Slavic Languages and Literatures. Advising is provided by these departments. Modern European Studies is available as part of a Double Major only and must be taken in combination with a Major concentration in French, German, Italian or Spanish. This concentration differs, however, from the concentration for the single Major or for the Double Major without Modern European Studies, with a greater emphasis on language and/or on post-1900 literature and culture. Students' Double Major programs with Modern European Studies will be approved by the language and literature department of their Major concentration. Students must consult advisers at the end of their second year or in the summer before registering.

Requirements for the B.A. Degree**First and Second Years**

- History 120—European History from the Renaissance to the Present (as available).
- Prerequisites for departmental and European components of the program that will be taken in senior years. This will include prerequisites for senior courses in the two European languages that will be required. Since prerequisites differ from department to department, students are advised to give early thought to where they wish to concentrate. Prerequisites for required or recommended 300- or 400-level courses are listed in the Modern European Studies Handbook (available from departmental and Faculty advisers).

A course in a non-European subject is suggested.

Courses with European content recommended as first- and second-year electives are listed in the Modern European Studies Handbook.

Third and Fourth Years

- Department requirements: Students will concentrate in one of the following language areas, selecting courses from those listed.

French: 30 credits as required for the Major, but selecting French literature and culture courses (including, whenever possible, those offered in the post-1900 period), rather than Quebec or linguistics options.

German: 30 credits, including German 300 (6), 310 (6) and 321 (3) and at least six additional credits in the area of 20th-century literature or culture (depending on courses offered in specific years).

Italian: 30 credits emphasizing modern Italian language and literature, to be chosen from the following: Italian 300 (6), 304 (6), 400 (6), 408 (3/6), 420 (3/12), Italian Studies 432 (6).

Spanish: 30 credits emphasizing modern Spanish language and literature, to be chosen from the following: Spanish 300 (6), 355 (6), 400 (6), 444 (3/6), 457 (3/6), 458 (3/6).

- Modern European Studies requirements: Six credits numbered 300 or above in a modern European language, literature or culture (other than English) outside of the language area of primary concentration. Languages/Literatures available include: French, German, Italian, Polish, Portuguese, Russian, Spanish. Excluded are all courses in literature or culture given in English translation, and (except with the special permission of the adviser) the following third and fourth year introductory language and literature courses: French 340, 341, 342; German 430; Italian 302; Scandinavian 301, 401; Spanish 305, and Spanish 307 (Portuguese); Russian 401; Ukrainian 325, 425.

24 credits (at least 12 from List I), to be chosen in consultation with an adviser, from the appropriate list in the Modern European Studies Handbook.

- Elective Requirement: Six credits of third- or fourth-year electives to be taken outside the subjects or fields of specialization.

Museum Studies

The University Museum of Anthropology offers training in museum principles and methods for both undergraduate and graduate students. Theory is combined with practical experience provided in laboratories, workshops, and in the ongoing research and public programs of the Museum. The core of the training program is Anthropology 341 (An Introduction to Museum Anthropology), Anthropology 431 (The Care of Collections), and Anthropology 432 (The Anthropology of Public Presentation). It is recommended that students take additional course work in museum-related subjects offered by this department or by other departments such as Asian Studies, Classics, Fine Arts, History, and Archival Studies. Additional opportunities for tutorials, workshops, internships, and job training are offered to advanced students by special arrangement.

Students intending to obtain a B.A., M.A., or Ph.D. degree with Museum Studies as a component or focus should apply to the appropriate department for admission to a discipline such as Anthropology, Asian Studies, Classics, Fine Arts, or History, and seek information from the Administration Office of the Museum of Anthropology. People already working in the museum community or who wish to upgrade their knowledge and skills without entering a formal degree program or becoming full-time students are invited to consider the core training program or graduate seminars in Museum Studies. Admission is subject to the permission of the instructor and to the University regulations for admission as an unclassified student or auditor.

UBC Museum of Anthropology Awards and Financial Assistance**The Lois McConkey Memorial Fellowship for First Nations Work-Study Program**

To honour the memory of Lois McConkey, author, educator, and founding member of the Volunteer Associates at the UBC Museum of Anthropology, and to pay tribute to her many contributions to educational work, her family, colleagues, and friends have established a fellowship for secondary school and university students of North American First Nations descent. The award, approximately \$800, may be made annually to a student of Native descent who would benefit from an established work-study program at

the Museum of Anthropology. The fellowship would contribute to the salary of the student working at the Museum in a supervised program, and may be supplemented by other funds if available. Enrolment in university courses will not be required of the candidate who has not yet completed secondary school. The award will be made on the recommendation of the Director of the Museum of Anthropology and the President of the Museum's Volunteer Associates. If in any one year a suitable candidate is not found the fellowship may not be awarded.

Music

The School of Music offers a B.A. degree in music designed for students interested in studying music as one of the liberal arts. The degree is also an alternative to the B.Mus. degree in Music Theory and Music History and Literature for students interested in graduate work in those fields, or in ethnomusicology. Students wishing to become professional performers, composers, or teachers should, if qualified, consider the appropriate Major in the B.Mus. program.

Requirements for the B.A. Degree

For the general course requirements of the B.A. degree, see "Faculty Requirements" at the beginning of the Faculty of Arts section.

Admission Requirements

There are no performance requirements for entry into the B.A. in Music. Students taking ensemble or private instruction courses will need to audition at the School of Music for placement purposes.

Major:

First Year

- Music 120 and 121
- one of:
 - Music 103 and 104 or
 - Music 100, 101 and 105 or
 - Music 100, 101 and ensemble

Second Year

- Music 220 and 221
- one of:
 - Music 203 and 204 or
 - Music 200, 201 and 205 or
 - Music 200, 201 and ensemble

Third and Fourth Years

- a total of 60 credits, including:
 - 18 credits at the 300 or 400 level*
 - 30 credits of 300- or 400-level Music courses*
 - at least 12 credits of electives outside Major subject

* Any 300- or 400-level Music course, as well as Music 107 (Composition I, taken during the third or fourth year) is acceptable toward fulfilment of the requirement.

When entering the Major program at the beginning of the third year, the student must draw up a plan of study for the last 60 credits of course work, in consultation with a School of Music adviser. Another review by an adviser must precede the final 30 credits.

Honours:

First and Second Years

As for Major.

Third and Fourth Years

A total of 72 credits is required, including:

- 42 credits of 300- and 400-level Music courses¹ including Music 449 and at least 18 credits in music theory, music history, or ethnomusicology
- at least 12 credits at the 300- or 400-level¹
- at least 18 credits of non-Music courses

Minimum second-class average in each year.

The Honours program is open only to students who show special aptitude and the capacity to profit from working extensively in this field. The School may terminate a student's candidacy for Honours if, after a prescribed process of evaluation, it decides that an appropriate level is not being maintained, at least a 65% average notwithstanding.

¹ Even though the ensemble courses in Music have 100 numbers, they will count as 300- or 400-level courses, and hence as part of the Major or Honours requirements, subject to the following qualifications:

- 1) a third- or fourth-year student wishing to count ensembles toward a Major or Honours requirement either must have taken two years of ensemble work as part of the theory prerequisite for the Major or Honours degree, or be placed by audition. Having satisfied this condition,
- 2) such a student may elect a further eight credits of large or small ensemble work as part of the Major or Honours requirement.

Only 300- and 400-level private instruction will count in fulfilment of this requirement. Up to eight credits of private instrumental or vocal lessons may be elected during the last two years of this program, with permission of the Director of the School of Music. Students will be placed at the appropriate level by audition.

Philosophy

The Department of Philosophy offers programs of study that lead to the degrees of Ph.D., M.A., and B.A. Brochures giving details of each program, descriptions of courses and other information are available from the Department.

Requirements for the B.A. Degree

Major:

First Year

- six credits from Philosophy 100 (6), 115 (6), 120 (3), 125 (3), 210 (6), or Arts One are recommended

Second, Third and Fourth Years

- Philosophy 220 (Symbolic Logic I)
- Philosophy 230, 330 (Moral and Political Philosophy I and II)
- Philosophy 240, 340 (Knowledge and Reality I and II)
- six credits of 300-level History of Philosophy from Philosophy 310, 311, 314, 315
- additional credits from third- and fourth-year Philosophy courses (excluding 400, 401) or Greek 416 or Classical Studies 336 or 337 to provide a total of at least 30 credits. No more than six credits of Greek 416 (3), Classical Studies 336 (3), 337 (3), Philosophy 371 (6) and Philosophy 372(6) may be counted toward the 30-credit Major program in Philosophy, except with the permission of the Department.

Honours:

Students are encouraged to apply to the Department for admission to the Honours program at the end of their second year. Applicants are normally expected to have obtained a grade of at least 80% in at least two of Philosophy 220, 230 or 240 and a recommendation from a Philosophy instructor.

First Year

- six credits from Philosophy 100 (6), 115 (6), 120 (3), 125 (3), 210 (6), or Arts One are recommended

Second, Third and Fourth Years

- Philosophy 220 (Symbolic Logic I)
- Philosophy 230, 330 (Moral and Political Philosophy I and II)
- Philosophy 240, 340 (Knowledge and Reality I and II)
- six credits of 300-level History of Philosophy from Philosophy 310, 311, 314, 315
- additional credits from third- and fourth-year Philosophy courses (excluding 400, 401) or Greek 416 or Classical Studies 336 or 337 to provide a total of at least 36 credits. No more than six credits of Greek 416 (3), Classical Studies 336 (3), 337 (3), Philosophy 371 (6) and Philosophy 372(6) may be counted toward the 36-credit Honours program in Philosophy, except with the permission of the Department.
- at least 12 credits of tutorial work (Philosophy 390, 490). There is an oral examination at the end of each year's tutorial.

Political Science

The Department of Political Science offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the B.A. Degree

Major:

Second Year

- Political Science 200 and two from 220, 240, 260

Students are normally expected to complete these requirements in their second year, and **must** have completed at least two of the courses before applying for admission to the program.

Third and Fourth Years

60 credits including:

- Political Science 349 and 380, normally to be completed in the third year of the program. Political Science 340 may be taken in lieu of Political Science 349
- 24 additional credits from Political Science courses numbered 300 and above (21 credits if Political Science 340 is taken)
- 30 additional credits, of which at least 12 must be taken in departments other than Political Science

Honours:

Second Year

As for the major.

Third and Fourth Years

72 credits including:

- Political Science 340, 380, 390, 490, 491
- nine additional credits from Political Science courses numbered 300 and above, of which six credits must be taken at the 400 level
- 30 additional credits, of which at least 12 must be taken in other departments

Honours: Political Science with International Relations

- Faculty of Arts first-year English requirement
- Political Science 200 and 260, plus one other 200-level Political Science course

- Economics 100
- History 125
- 12 credits of a language other than English, **in addition to the Faculty of Arts language requirement.** The language may be the one used to satisfy the Faculty of Arts requirement carried to a higher level, or it may be an additional language. This requirement may be completed in the third and/or fourth year.

Third and Fourth Years

72 credits including:

- Political Science 340, 380, 390, 490, 491
- 12 credits from: Political Science 360-366, 460-464, of which at least three credits must be at the 400 level
- Economics 355
- History 430 or 432

Admission and Promotion

Admission is not automatic to either the Major program or Honours program in Political Science. Students must submit a formal application. Because there are a limited number of spaces, some applicants who satisfy the minimum prerequisites may not be admitted.

Students contemplating a Major or Honours program in Political Science are strongly encouraged to seek information and advice from the department at the end of their first year. Application forms will be available after January 1 from the Political Science Department. Completed applications are due by May 15 prior to registering for the third year. Applicants should arrange for transcripts from all post-secondary institutions they have attended, other than UBC, to be mailed to the department office as promptly as possible.

Major Program

Selection for admission to the Major program will be based on the average grade for all post-secondary work attempted to date toward the B.A. degree, with the exception of 12 credits which may be excluded from the calculation. The average will be calculated on at least 48 credits, including all courses taken in Political Science, as well as six credits of first-year English.

Promotion to the fourth year of the Major program will be automatic for students in the third year of the program whose work meets university standards for continuing. For students not in the third year of the program, admission to the fourth year will be allowed, in exceptional circumstances, for transfers from colleges or other universities or students at UBC who have performed well in Political Science courses in their third year but are not in the Political Science Major program. Selection of applicants from these categories will be based on overall standing (average) of the best 72 credits earned to date toward the B.A. degree. These 72 credits must include all Political Science courses and English 100 (or its equivalent).

Honours Program (including Honours in Political Science with International Relations)

To be accepted into the Honours program, students normally require 80% mark in at least one Political Science course and a 75% overall average in their second year.

Promotion to the fourth year of the Honours program requires

- 1) an 80% mark in at least one Political Science course during the third year,
- 2) a minimum of 75% in Political Science 390, and
- 3) a 75% average overall in the third year.

Occasionally, an outstanding student from the third-year Major program may be admitted directly to fourth-year Honours.

Graduation in the Honours program normally requires

- 1) an 80% mark in at least one Political Science course during the fourth year,
- 2) a minimum of 75% in both Political Science 490 and 491, and
- 3) a 75% overall average in the final two years.

Students not meeting these standards but nevertheless satisfying all other university requirements for graduation will be awarded a B.A. in the Major program.

Courses Offered

Political Theory: 240, 340, 342, 344, 346, 349, 440, 442, 444, 446, 521, 522, 523

Public Policy: 302, 350, 404, 531, 532, 533

Canadian Government: 200, 301, 303, 304, 305, 306, 307, 401, 402, 403, 404, 405, 501, 502, 503, 504

International Relations: 260, 360, 361, 362, 363, 364, 365, 366, 367, 460, 461, 462, 463, 464, 465, 561, 562, 563, 564, 565

Political Behaviour: 380, 381, 385, 551, 552, 553, 571, 572

Comparative Government: 220, 320, 321, 322, 323, 324, 325, 328, 329, 420, 421, 422, 423, 424, 425, 511, 512, 513, 514, 515, 516

General Courses: 390, 490, 491, 540, 549, 580, 649

Note: The Department issues a pamphlet each May to inform students in detail about courses beginning the following September. Students should obtain a copy before choosing courses.

Portuguese

See Hispanic and Italian Studies.

Psychology

The Department of Psychology offers programs of study that lead to the degrees of Ph.D., M.A., B.A., B.Sc.

For information about the degree of Bachelor of Science, see the Faculty of Science section of the *Calendar*.

Requirements for the B.A. Degree

Major:

First Year

- Psychology 100

Second Year

- six credits from Psychology 201, 202, 203, 204, including at least one of Psychology 201 or 202

Third and Fourth Year

- Psychology 317 and 318 (to be taken in third year)
- at least 24 additional Psychology credits including:
 - at least six credits from: Psychology 300, 302, 303, 305, 308, 314, 315, 336, or 337 **and**,
 - at least six credits (nine credits for students who took only one of Psychology 201 or 202) from: Psychology 304, 306, 307, 309, 310, 313, 333, 334, 355, or 360

Notes: (1) Students are reminded that the Faculty of Arts requires that among the final 60 credits, in addition to any course(s) taken to satisfy the literature, science, or language requirements, at least 12 credits must be outside of Psychology. (2) Students who are contemplating gradu-

ate studies or other research activities in Psychology are urged to take Psychology 464 in addition to the above minimum requirements for the B.A. degree.

Honours:

The Honours program is designed to provide intensive and extensive preparation in Psychology for outstanding students who intend to pursue graduate studies in Psychology. In addition to the requirements listed below, such students are urged to include Psychology 464 in their program of studies.

Admission to the Honours program requires at least a 75% average in the second year and at least 80% in Psychology 201 and/or 202. Students failing to meet either of these criteria may petition for admittance into the program. All students enrolling in the Honours program must consult with the Chair of the Departmental Honours-Major Committee.

Graduation in the Honours program as described below requires:

- 48 credits of Psychology courses numbered 300 or above;
- at least a 75% average in each of the last three years;
- at least 75% standing in Psychology 366 and 80% in at least six Psychology credits taken during the third year; and
- 80% in at least six Psychology credits taken during the fourth year.

First and Second Years

- six credits from Psychology 201, 202, 203, 204 including at least one of Psychology 201 or 202
- six credits of Mathematics (100 and 101 recommended)
- Biology 101 or 102

Third Year

- a minimum of 36 credits taken concurrently, including Psychology 312 and 366

Fourth Year

- a minimum of 36 credits taken concurrently, including Psychology 449 and at least six credits of a Psychology laboratory course numbered above 400
- in addition, during third and fourth years, an Honours student must take:
 - at least 12 credits of: Psychology 300, 302, 303, 305, 308, 314, 315, 336, 337 or 401, **and** at least 12 credits (15 credits for students who took only one of Psychology 201 or 202) of: Psychology 304, 306, 307, 309, 310, 313, 333, 334, 355, or 360.

For course prerequisites, see course descriptions.

Punjabi

See Asian Studies: South Asian Languages.

Religion and Literature

To integrate many aspects of diverse religious traditions and the literary cultures in which they have functioned, the major program in Religion and Literature is based on core courses and seminars and employs many resources within the Faculty of Arts. The student must take the two seminars and a selection from the core list and then a number of courses from the broader list in the program brochure which is revised annually. The disciplines contributing to this extensive list each year could include Asian Studies, Classics, English, French, Germanic Stud-

ies, Hispanic and Italian Studies, Religious Studies, Russian and Slavic Languages and Literatures, and Theatre.

Note: Students majoring in Religion and Literature must select their courses with the help of an adviser.

Requirements for B.A. Degree

Major:

First and Second Years

- six credits from Religious Studies 100, 202, 204 or 205
- six credits from Asian Studies 105, 115, 206, Classical Studies 100, 210, English 201, 203, Germanic Studies, 201, 202, Russian 206, 207.

Third and Fourth Years

- 33 credits which must include Religion and Literature 371 and 471
- six credits of Religious Studies courses numbered 300 and above
- six credits from Asian Studies 345, Classical Studies 310, English 311, English 355, English 375, or Italian Studies 310
- 15 credits selected in consultation with a program adviser from the courses listed in the program brochure

Religious Studies

The Department of Religious Studies offers programs of study that lead to the degrees of Ph.D., M.A., B.A. In March a booklet giving detailed information about the programs and courses offered by the Department is available from the Department.

Requirements for the B.A. Degree

Major:

First and Second Years

- a minimum of six credits from Religious Studies 100, 202, 204 or 205

Third and Fourth Years

- 36 credits to be selected from Religious Studies courses numbered 300 or above (including Arabic and Hebrew)

Subject to the approval of the Department, a maximum of 12 credits of the following courses may be accepted for credit toward a major in Religious Studies:

Anthropology (ANTH)

- 333 The Analysis of Myth
- 415 Religion and Society

Asian Studies (ASIA)

- 325 History of Chinese Thought
- 360 The Making of the Sikh Tradition

Classical Studies (CLST)

- 305 Classical Myth and Religion

English (ENGL)

- 311 Literature of the Bible

Fine Arts (FINA)

- 353 Buddhist Art of Japan
- 357 Early South and Southeast Asian Art
- 358 Later South and Southeast Asian Art

History (HIST)

- 372 Ideas and Institutions of the Middle Ages

Italian Studies (ITST)

- 310 The Divine Comedy in Translation

Music (MUSC)

- 327 Liturgical Music I
- 427 Liturgical Music II

Philosophy (PHIL)

- 349 Philosophy of Religion

Minor:

First and Second Years

- a minimum of six credits from Religious Studies 100, 202, 204 or 205

Third and Fourth Years

- 24 credits to be selected from Religious Studies courses numbered 300 or above (including Arabic and Hebrew)

Subject to the approval of the Department, a maximum of six credits from outside the Department may be accepted for credit toward a minor in Religious Studies. The courses acceptable for such credit are listed above (see Major).

Honours:

Admission

- a minimum of six credits from Religious Studies 100, 202, 204 or 205

Third and Fourth Years

A program will be devised for each student, consisting of 54 credits and including a graduation essay (Religious Studies 499). Subject to the approval of the Department, a maximum of 18 credits may be chosen from the list of courses outside the Department (see list above, under Major). Courses in Arabic and Hebrew may also be included.

Areas of Concentration (for Majors and Honours)

Students who intend to do graduate work are advised (but not required) to choose an area of concentration in the third and fourth years, and to acquire some proficiency in the appropriate canonical language(s). For languages other than Arabic and Hebrew, see the listings of the appropriate departments.

- 1) Asian Religions: Religious Studies 204, 354, 361, 364, 365, 366, 367, 368, 430, 452; Asian Studies 325, 360.
- 2) Christianity (Post-Biblical): Religious Studies 205, 315, 321, 323, 326, 327, 420, 421, 422.
- 3) Hebrew Bible and the Ancient Near East: Religious Studies 202, 300, 304, 305, 306, 403; Hebrew 305, 405, 479.
- 4) Islamic Studies: Religious Studies 202, 340, 341, 448, 449; Arabic 300, 400.
- 5) Judaic Studies: Religious Studies 202, 308, 309, 310, 311, 312, 407, 408, 409.
- 6) Near Eastern Languages and Literature: Religious Studies 202; Arabic 300, 400; Hebrew 305, 405; appropriate courses from areas 3, 4, or 5.
- 7) New Testament: Religious Studies 202, 304, 305, 314, 414, 415.

Romance Studies

See Hispanic and Italian Studies.

Russian and Slavic Languages and Literatures

There is no Department of Russian and Slavic Languages and Literatures, but students may take a Minor in Russian Language. In addition, a fairly wide range of courses may be available in Russian and East European literatures and in the Ukrainian language, as well as a first-year course in Russian and Slavic cultures. Several courses are offered in Slavic literatures in translation, requiring no knowledge of a Slavic language.

Courses that may be offered from time to time are:

Language Courses: Russian 100, 101, 102, 200, 215, 300, 315, 400, 401; Ukrainian 325

Introductory Courses: Culture and Literature: Slavic Studies 105

Other Courses in Russian Literature: Russian 305, 407, 408, 409

Russian Literature in Translation: Russian 206, 207, 306, 410, 411

Slavic Literatures in Translation: Slavic Studies 307

Literature courses in translation are designed for students who are interested in broadening their knowledge of literature. They are especially recommended for students majoring or honouring in language and literature departments, history, political science, anthropology, sociology and fine arts, but are also open to students from all other programs. These courses are of special interest to students planning to pursue literary and gender studies of a comparative nature.

Requirements for the Minor in Russian language

36 credits consisting of:

First Year

- Russian 100 (6) or 101 (3) and 102 (3)

Second Year

- Russian 200 (6)
- Russian 215 (3) (May be taken in third year)

Third Year

- Russian 300 (6)
- Russian 305 (6) (May be taken in fourth year)
- Russian 315 (3) (May be taken in fourth year)

Fourth Year

- Russian 400 (6)

Sanskrit

See Asian Studies: South Asian Languages.

Slavic Area Studies

Students wishing to focus on the Slavic area should major in a discipline (e.g. Economics, Geography, History, Political Science) and supplement their training by taking the Minor in Russian Language, or by taking appropriate courses in Slavic languages and/or other Slavic area studies courses as their electives. Students planning to go on to graduate study will find it advantageous to have a strong background in a discipline.

The following courses on the Slavic area do not require knowledge of Russian or another Slavic language:

Russian (RUSS)

- 306 Russian Literature in Translation
- 410 Women and Gender in Russian Literature
- 411 Selected Russian Authors in Translation

Slavic Studies (SLAV)

- 307 Modern Slavic Literatures in Translation

Economics (ECON)

- 387 The Soviet Economy
- 487 Comparative Economic Systems (if dealing with Slavic area)

Geography (GEOG)

- 493 Geography of Eastern Europe
- 494 Geography of the Ex-Soviet States

History (HIST)

- 319 History of Modern Poland
- 324 History of East Central Europe in the 19th and 20th Centuries
- 405 Russia before 1917
- 408 History of the Hapsburg Monarchy
- 435 Communist Movements in Russia and Eastern Europe since 1900
- 438 History of the Soviet Union

Political Science (POLI)

- 325 Communist and Post-Communist Politics
- 362 The Great Powers and International Politics
- 460 Foreign Policy Analysis (section dealing with Soviet foreign policy)
- 464 Problems in International Relations (section dealing with Soviet-American relations)

Note: The University provides opportunity for graduate work in Slavic Area Studies in the fields of Geography, History (Russian, Soviet and East European), and Political Science. Students wishing to do graduate work in the area will normally be required to have completed at least 12 credits of a Slavic language (Russian, Polish, or Ukrainian) by the end of the first year of graduate work.

Sociology

The Department of Anthropology and Sociology offers programs of study that lead to the degrees of Ph.D., M.A., B.A.

Requirements for the B.A. Degree**Major:****First Year**

- Sociology 100

Second Year

- Statistics 203 (Students pursuing majors at Okanagan University College may use either Mathematics 121 or Sociology 371 to satisfy the statistics requirement.)
- at least three credits from Sociology 201, 210, 213, 214, 240, 250, 260

Third and Fourth Years

- at least 30 credits of Sociology, including Sociology 310 and 350, and at least one of Sociology 380, 381, 382, 383, all normally taken in the third year
- additional Sociology (and some Anthropology) courses taken in consultation with a departmental adviser

Honours:**First Year**

- Sociology 100

Second Year

- Statistics 203
- at least three credits from Sociology 201, 210, 213, 214, 240, 250, 260

Admission to the Honours Program

A standing of 75% or better in Sociology 100 and an overall second-class average in the second year are required for admission to the third year. Continuation to the fourth year requires an overall second-class average in the third year and an average of at least 75% in the sociology courses taken in the third year. Outstanding students from the third-year major program may be considered for admission into the fourth-year Honours program. Interested students should consult the sociology adviser.

Third and Fourth Years

A total of 72 credits including 42 credits in Sociology as follows:

- Sociology 310, 350, and 449
- at least one of: Sociology 380, 381, 382, 383
- 15 additional credits of Sociology of which at least six credits must be from Sociology courses numbered 400 and above, in addition to Sociology 449.
- 30 additional credits, of which at least six must be from another discipline.

Undergraduate Courses

Sociology 100 is the prerequisite for all third-year and fourth-year courses, except Sociology 300, 301, 315, 330, 352, 425, 465, and 466.

Each May the Department issues a booklet to inform students in detail about courses that will be offered the following September. Students should obtain a copy in preparation for seeing the departmental adviser and for registration.

South Asian Studies

See Asian Studies.

Spanish

See Hispanic and Italian Studies.

Theatre and Film

The Department offers programs of study that lead to the degrees of Ph.D., M.A., M.F.A., B.A., and B.F.A. in Theatre. In addition, the Department offers an M.A. in Film History and Criticism, a B.A. and Diploma in Film Studies, and an M.F.A. in Film Production. For the B.A. and Diploma Film programs, see "Film".

At the undergraduate level, the Department offers four distinct streams of study:

- 1) B.A. in Theatre
- 2) B.F.A. (Acting)
- 3) B.F.A. (Design/Technical Theatre)
- 4) B.A. (Film Studies)

Requirements for the B.A. Degree**Major: Theatre****First and Second Years**

- Theatre 120 and either 160 or 150 or both

Third and Fourth Years

- 30 credits in Theatre, numbered above 300, including Theatre 310 and 320

Honours: Theatre**Admission**

- Theatre 120 (First- or second-class standing)
- Theatre 160

Third and Fourth Years

- 36 credits in Theatre numbered above 300, including Theatre 310, 320, 410, 449
- 12 credits chosen from Theatre 400, 405, 430; English 365, 36; or Creative Writing 407 (see special admission procedures under **Creative Writing**)
- reading knowledge (by the end of the fourth year) of one of French, German, Italian, Spanish, Russian, Chinese, Japanese, or Greek

Requirements for the B.F.A. Degree

The program leading to the B.F.A. degree normally consists of four years of study. In the first year, students take courses applicable to any B.A. program, including the Theatre courses noted below. Application to enter the B.F.A. program proper is made early in April of the student's first year or the week before the beginning of classes in the student's second year. The number of places available in the program is strictly limited, hence entry into the program is by selection based on an audition (Acting stream) or an interview (Design/Technical Theatre stream). Unsuccessful applicants will be able to continue into the second year of the B.A. program. Students who have been admitted to the B.F.A. program may revert to the B.A. if this is advisable at the end of the second or the third year. All students enrolled in the B.F.A. program will be reviewed annually to determine whether they should be allowed to continue in their course of study.

Prospective candidates may obtain details concerning the principles and procedures governing the selection of students from the Department of Theatre.

Acting**First Year**

- requirements of first-year B.A. including Theatre 120 and 160

Second Year

- requirements of second-year B.A. including Theatre 261 and 262

Third Year

- Theatre 310, 361/362/370, and six credits of electives

Fourth Year

- Theatre 320, 461/462/470, and six credits of electives

Design/Technical Theatre

First Year

- requirements of the first-year B.A. including Theatre 120 and 150

Second Year

- requirements of second-year B.A. including Theatre 250 and 251

Third Year

- Theatre 305, 310, four courses chosen from Theatre 350-354, and six credits of electives

Fourth Year

- Theatre 320, 459, four courses chosen from Theatre 405, 450-454, and six credits of electives

Enrolment in the program will be limited, and preference will be given to students with strong evidence of creative ability, either in Theatre or in one of the other fine arts. Prospective students should enquire at the Department of Theatre and Film for times when materials are evaluated.

Urban Studies

Urban Studies offers a focus for students who have a keen interest in this field. It is not a degree program.

Course of Studies

A student will normally take Urban Studies 200 in the second year, along with the prerequisite courses for a departmental Major. In the third and fourth years, in addition to the Major requirements, 24 credits of courses focusing on urban questions (including those offered in the student's Major department) are required. In the fourth year a student will normally take Urban Studies 400.

Urban-oriented Courses

A tentative (and not necessarily exhaustive) list of existing undergraduate courses that can be defined as "urban oriented" appears below. Some of these courses may have prerequisites. Students should discuss them with the department concerned before registering.

- Anthropology 310
- Architecture 424, 425
- Commerce 307, 409
- Economics 374
- Geography 350, 352, 357, 360, 417, 450, 453, 457, 464
- Planning 425
- Political Science 306
- Sociology 354, 425

Students interested in Urban Studies should contact the Senior Faculty Adviser of the Faculty of Arts, or the Chair of the Urban Studies Committee, Dr. W. G. Hardwick (Geography), telephone (604) 822-3535.

Urdu

See Asian Studies: South Asian Languages.

Women's Studies

Students intending to specialize in Women's Studies may do so either by taking an interdisciplinary Major program in Women's Studies, or by completing a Major program in a particular department of the Faculty of Arts, with outside electives taken from the courses listed below.

Detailed descriptions of the program, courses, and other information are available from the Women's Studies office, telephone (604) 822-9173.

Note: Students majoring in Women's Studies must have their courses approved each year by a Women's Studies adviser. A double major is encouraged.

Major:

First and Second Years

- Women's Studies 100 is required.
- six credits from 200-level Women's Studies courses or ANSO 213.

Third and Fourth Years

- Women's Studies 322 and 324 (to be taken in third year)
- either Women's Studies 422 or 424 (one is required and both are recommended; to be taken in fourth year)
- at least 15 additional credits from courses eligible for credit toward a major:
 - Women's Studies 422 or 424 (whichever was not taken as a requirement)
 - Women's Studies 425 (can be repeated for credit)
 - Women's Studies 450 (can be repeated for credit)
 - Anthropology/Sociology 312
 - Classical Studies 311, 312
 - Economics 351
 - Family Science 412
 - French 419 or 422
 - History 335
 - Political Science 329
 - Psychology 320
 - Religious Studies 480
 - Russian 410
 - Sociology 414
 - Theatre 415

Note: Women's Studies 300 may not be taken for credit toward the major.

Courses of related interest but not counted toward the major

- Anthropology 214, 409
- Economics 360
- Family Science 322, 414
- History 329
- Sociology 214, 240, 310, 361

Students should consult the Women's Studies office for additional relevant courses in a given year.

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The Practice of Audiology and Speech-Language Pathology

Audiologists and speech-language pathologists provide professional services to individuals with communication impairments. They may work in hospitals, clinics, private agencies, schools, health units and other rehabilitation or education settings. Such services require an understanding of rapidly changing information in the speech, language and hearing sciences, as well as diagnostic and treatment skills.

The School subscribes to the philosophy that the scientific and professional fields of audiology and speech-language pathology are based on, and unified by, the study of human communication. These fields are thus concerned with hearing and speech functions, and especially with the understanding and use of language - at all levels of physiological, linguistic and psychological organization, and in all modalities.

The School maintains that the theories and empirical data of linguistics, psychology, acoustics, physiology and other related disciplines provide the necessary framework for the study of human communication and its disorders. The School's commitment to this view is realized in a specified, interdisciplinary program of undergraduate prerequisites and in a graduate curriculum that incorporates both basic and applied science. Successful completion of the program requires thorough knowledge of research in speech, language, and hearing in normal and disordered populations, as well as demonstration of clinical competence. Students are expected to learn the methods of scientific inquiry and to apply these principles to clinical problems across the scopes specified by the Foundations of Practice adopted by the Canadian Association of Speech-Language Pathologists and Audiologists.

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The School of Audiology and Speech Sciences offers a post-graduate program leading to the Master of Science (M.Sc.) degree. This program, designed to provide the scientific and clinical education necessary for the professions of Audiology and Speech-Language Pathology, is composed of a core curriculum with options for some specialization. After completing basic level core courses, students elect to major in either Audiology or Speech-Language Pathology. Graduates of this program will have completed the academic and practical requirements for professional certification. The M.Sc. program will usually require 24 to 36 months to complete, depending on the student's undergraduate preparation. With completion of prerequisite and core curriculum courses open to undergraduates, a student is eligible for the two year program (see below).

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The program provides each student with at least the minimum number of hours of clinical practice required for certification by Canadian professional associations. Prior to this experience students participate in individual and group observations of audiologists and speech-language pathologists. These observations serve to acquaint the student with different settings in which an audiologist or a speech-language pathologist may work. They also introduce the student to a variety of diagnostic and treatment techniques. After completion of basic clinical coursework and laboratories, each student completes a clinical practicum in the minor area of interest and two externships in the major area of interest. After completion of more advanced coursework in the major, each student

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The first objective of the School of Audiology and Speech Sciences is to provide for the education of audiologists and speech-language pathologists. This education begins with Bachelor's-level emphases in Linguistics and Psychology and culminates with the M.Sc. in Audiology and Speech Sciences. The second objective of the School is to engage in research related to human communication and its disorders. As an integral part of this endeavour, the School offers the Ph.D. degree and M.Sc. thesis opportunities.

completes further externship work in that area. During the externships the student gradually assumes a full caseload under supervision. The clinical education program strives to provide each student with experience in all aspects of the major as well as a foundation of clinical experience in the minor.

Undergraduate Preparation

Admission to the M.Sc. program is on a competitive basis. Applicants should have appropriate undergraduate preparation as defined below. A cumulative average of at least 76% over the last two years of a four-year undergraduate degree, and at least 12 credits with a minimum grade of 80% in courses at the 300 level or above, are minimum requirements.

A number of courses are considered appropriate preparation for graduate work in Audiology and Speech Sciences. Students accepted into the program normally have a degree in either linguistics or psychology, with good background in the other discipline.

Students intending to apply for admission to the program should: 1) complete a minimum of five of the prerequisite and core curriculum courses listed below; 2) develop an undergraduate major which will include, in addition to the five courses, as many of the prerequisite, core curriculum and recommended courses listed below as possible. This can be achieved through either a linguistics or a psychology bachelor degree. However, UBC and University of Victoria undergraduates are encouraged to complete the Speech Science major offered by the Linguistics Departments at these universities. Numbers listed below refer to UBC course numbers.

Prerequisite and Core Curriculum Courses

A minimum of five of these courses must be completed prior to being admitted to the M.Sc. program. The M.Sc. program can be completed in either two or three years, depending on the number of prerequisite and core courses a student has completed prior to entry in this program. A student wishing to complete this program in two years must complete **all prerequisite and core courses** prior to admission to the program. A student planning to complete this program in **three years** may take up to

seven of these courses in the first year of the three-year program. The combination of courses which can be taken in the first year of this program is dependent on course scheduling and prerequisites determined by the UBC department offering the course. In view of potential scheduling conflicts, applicants are encouraged to complete as many of these courses as possible prior to the M.Sc. program. Note that UBC does not grant credit toward the degree for calculus or precalculus taken in fourth year or in a graduate program.)

The courses applicants have taken should cover the 12 content areas listed below. Applicants from UBC will take the courses listed for these areas. Applicants from other universities should have taken three to six credits each of the content areas listed.

Prerequisite and Core Curriculum Courses* (5 required for admission)

Content Area	UBC Course Numbers
Calculus or Precalculus	MATH 100 or 111
Syntax	LING 300
Phonetics	LING 310
Speech Production Mechanisms	LING 316
Introduction to Acoustic Phonetics	LING 317
Language Acquisition	LING 350
Phonology	LING 400
Developmental Psychology	PSYC 302, 315
Perception	PSYC 313
Research Methods	PSYC 317
Introduction to Neurolinguistics	AUDI 402
Auditory Mechanisms I	AUDI 511

The courses in the above list are required for the M.Sc. degree. Undergraduate students are encouraged to take them as part of their bachelor program, thus making room for graduate-level electives or making it possible to complete the M.Sc. program in two years.

Recommended Courses

(excellent preparation for M.Sc. program)

Course	
PHYS 110 or 115 or 120	1st Year Physics
CPSC 124, 126	1st Year Computer Science
AUDI 400	Introduction to Speech Pathology & Audiology
LING 301	Studies in Grammar II
LING 401	Studies in Phonology II
LING 405	Morphology

LING 427	Introduction to Semantics
LING 431, 432	Field Methods I & II
PSYC 304	Brain and Behaviour
PSYC 309	Cognitive Processes
PSYC 311	Individual Differences
PSYC 318	Analysis of Behavioural Data
PSYC 322	Psychology of Aging
PSYC 336, 337	Psychology of Language I & II
PSYC 360	Biopsychology
PSYC 414	Research Methods in Developmental Psychology
PSYC 521	Psycholinguistics

Students with other academic backgrounds who have outstanding academic records and who are interested in applying, should write to the Chair of the School's Committee on Admissions with the details of their academic preparation.

For further information concerning course listings at universities other than UBC, contact the Chair of the Committee on Admissions, School of Audiology and Speech Sciences, who will provide a list of acceptable equivalent courses at the other institution, provided equivalents exist.

Application for Admission

Persons interested in applying to the School's M.Sc. program should call or write for application materials. The application process then occurs in two stages:

- 1) Preliminary application: the applicant should return to the School the "Request for Application Material" and the "List of Prerequisites". Only when both of these forms have been received will the applicant be notified whether or not to proceed to the next step. Applicants who are non-native speakers of English must also provide a five to ten minute audio cassette recording of their speech. This speech sample can be on any topic, as long as it is neither read nor recited.
- 2) Full application: all of the following documents should be received by March 31.

These documents are:

- a) An application form, including the (yellow) "Additional Information" form, completed and signed.
- b) A processing fee of \$50 Canadian or \$40 US, by cheque, bank draft or money order, should be made payable to "UBC-Faculty of Graduate Studies".
- c) An updated (if warranted) "List of Prerequisites to the M.Sc. Program".
- d) A written statement by the applicant of up to 500 words indicating the reason for wishing to study audiology and/or speech-language pathology, the aspects of the field which are of particular interest to the applicant and any other relevant facts. At the end of the statement, a list should be given with the names of the professionals (at least one audiologist and one speech-language pathologist) who have been observed in the course of their practice.
- e) The official transcript(s) of all post-secondary institutions attended. If still attending university at the time of application, the applicant should send the most recent transcript available from that institution, as well as a list of the courses in which the applicant is currently enrolled, including the standing at the time. An official and complete transcript should also be sent as soon as available, even if past the application deadline. If any transcript is not in English or French, an official translation must be provided.
- f) Three letters of reference, at least two of which should be written by professors who taught the

applicant in the last two years of university work. These letters must be mailed directly to the School by the referees.

- g) Test of English as a Foreign Language (TOEFL). Proof of proficiency in the English language is required if English is not the applicant's native language. No offer of admission to the University will be made until we receive a TOEFL result. The minimum acceptable score for this program is 600.

It is the applicant's responsibility to ensure that all of these documents are received by the School. No application will be processed until all of the materials listed above have been received. Offers of admission are made in three rounds. Candidates who wish to be considered for a University Graduate Fellowship must submit their documents to arrive by January 15. Deadline for the second and major selection round is March 31. Candidates whose application materials are received after March 31 will be considered in an additional selection round, if positions are still available in the program. Applicants of exceptional merit may receive offers of early admission upon receipt of their application materials. January applicants who are recommended for fellowships will be notified of admission in February; those not recommended for fellowships will be considered for admissions in the second round. Second round candidates will be notified of admissions decisions no later than April, later applicants at a later date. Further questions should be addressed to the Chair, Admissions Committee, School of Audiology and Speech Sciences, The University of British Columbia, 5804 Fairview Avenue, Vancouver, B.C., Canada V6T 1Z3; telephone (604) 822-5591.

Students accepting an offer of admission to the M.Sc. program in the School of Audiology and Speech Sciences, at the time of acceptance of admission, are required to pay a non-refundable deposit of \$200, to be applied to the student's first-term tuition.

The School regrets that it has no direct sources of student support. Applicants with outstanding academic records will be nominated for University Graduate Fellowships. Those receiving awards will be notified in March. Other students may qualify for Canada Student Loans, or other awards and financial assistance programs. The School is pleased to document admissions status for students who may be applying for financial assistance.

Curriculum

The curriculum is designed to span three years; the following description reflects this design. Students may fulfill some of the curriculum requirements as part of their upper level undergraduate coursework. Those who plan in this way should be able to complete the M.Sc. program in two years, at the discretion of the School, and depending on how much of the core curriculum is included in the student's undergraduate education. Completion of the M.Sc. degree requires 1) fulfilment of the core curriculum and 2) completion of a minimum of 30 credits of coursework. In addition to course requirements, all students must complete either a thesis or a major essay. Those students electing the essay option are required to take a comprehensive examination in April of their final year of study.

Basic Core Courses

Requirements to be completed before declaration of a major in either audiology or speech-language pathology.

AUDI 402	Introduction to Neurolinguistics
AUDI 513	Acoustic Phonetics
AUDI 514	Auditory Mechanisms I

AUDI 518	Fundamentals of Audiology
AUDI 520	Developmental Phonetics and Phonology
AUDI 522	Communication Disorders: Assessment and Intervention
AUDI 523	Experimental Phonetics
AUDI 571	Developmental Language Disorders

Focused Core Courses

Requirement following selection of major (normally at the end of third term in a three-year program or at the end of the first term in a two-year program).

All students:

AUDI 516	Discourse Analysis
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Audiology major:

AUDI 552	Audiologic Assessment I
AUDI 554	Auditory Mechanisms II
AUDI 556	Aural Rehabilitation: Instrumentation
AUDI 559	Externship in Speech-Language Pathology for Audiology Majors

Speech-Language Pathology major:

AUDI 526	Acquired Language Disorders
AUDI 570	Phonological and Phonetic Disorders
AUDI 576	Disorders of Speech Production
AUDI 579	Externship in Audiology for Speech-Language Pathology Majors

Initial Externships

Summer after successful completion of Focused Core.

Audiology major:

AUDI 568	Audiology Externship I
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Speech-Language Pathology major:

AUDI 588	Speech-Language Pathology Externship I
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Advanced Core Courses

Students will concurrently work on thesis (AUDI 549) or essay (AUDI 548). Normally taken in final year of study, Term 1:

Audiology major:

AUDI 528	Aural Rehabilitation: Principles and Practice
AUDI 558	Physiological Measurement of Auditory Function
AUDI 560	Audiologic Assessment II
and one of:	
AUDI 562	Childhood Hearing Disorders
AUDI 564	Advanced Hearing Science

Speech-Language Pathology major:

four of:	
AUDI 528	Aural Rehabilitation: Principles and Practice
AUDI 572	Linguistic Aphasiology
AUDI 575	Language Development and Disorders in the School Years
AUDI 581	Communication of Special Populations
AUDI 583	Advanced Speech Science
AUDI 586	Acquired Speech and Language Disorders II

Term 2: All students will take at least one of:

AUDI 567	Topics in Audiology and Hearing Science
AUDI 580	Developmental Speech Perceptions
AUDI 585	Determinants of Language Development
AUDI 587	Topics in Speech-Language Sciences

Audiology major:

AUDI 569	Audiology Externship II
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Speech-Language Pathology major:

AUDI 589	Speech-Language Pathology Externship II
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Clinical Externships

In their practicum experiences, students provide supervised clinical service to persons with communication disorders. Professional ethics mandate that the School avoid assigning students to clinical work if their level of

knowledge, clinical skill or language competencies might lead to errors in judgment that could adversely affect their clients/patients. For this reason, student performance is evaluated by the faculty as a whole prior to the initial externship. To qualify for clinical externship placement, a student must:

- 1) Complete the laboratory portions of clinical courses with at least 68%.
- 2) Meet the Faculty of Graduate Studies requirements for continuation in the degree program.
- 3) Evidence competencies in oral English, both comprehension and production, which are adequate for clinical practice in English. This judgment is made by faculty members teaching courses with clinical content.

The School is very aware of the need to prepare audiologists and speech-language pathologists who can provide service to a variety of cultural groups. To this end, we will help non-native speakers of English to find assistance in meeting the third criterion. This may, however, lead to delays in obtaining the M.Sc. degree. Prospective students who wish further advice on this matter should arrange for an interview. Students should also note that one of their externship placements is likely to require temporary relocation outside the Vancouver area, e.g. Kelowna. This may entail some additional expense.

Doctor of Philosophy Ph.D.

The School of Audiology and Speech Sciences offers a Ph.D. degree, with specialization in one of the following areas: experimental phonetics, neurolinguistics/linguistic aphasiology, developmental phonetics and phonology, language acquisition, developmental language disorders, discourse analysis, phonological and phonetic disorders, speech understanding in the elderly, aural rehabilitation and hearing science. A brochure giving details of this program is available from the School's office.

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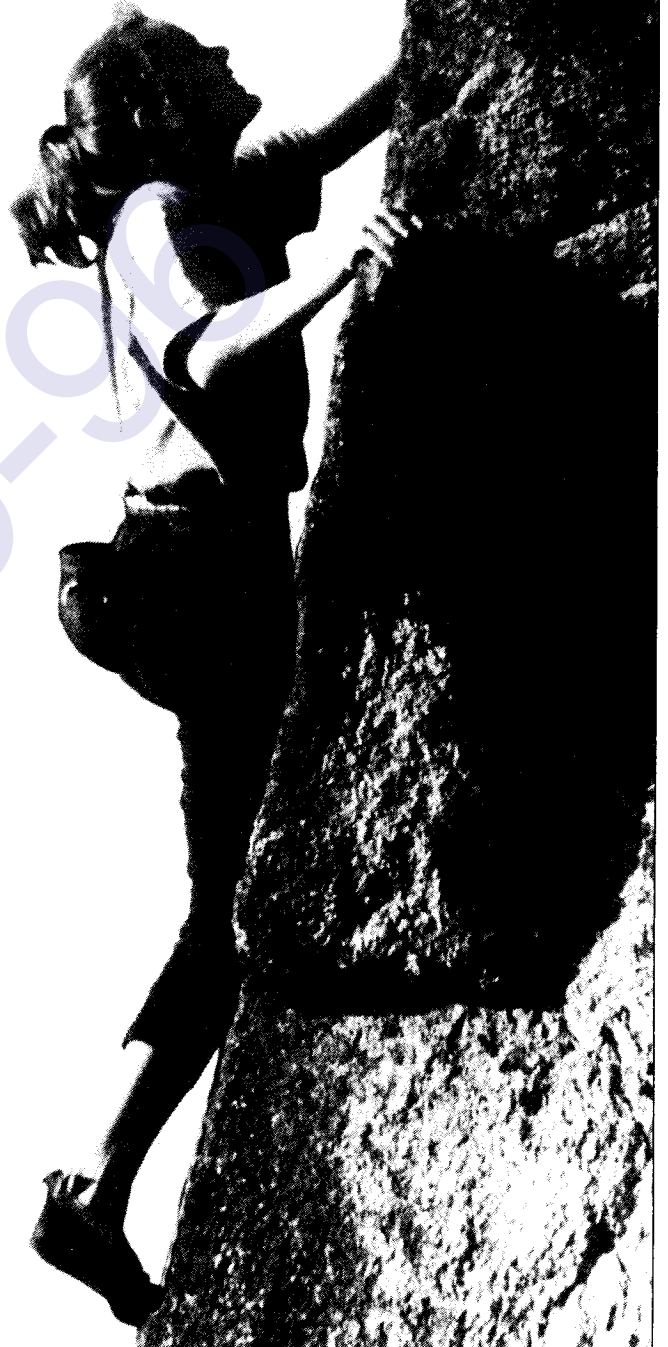
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Bachelor of Commerce B.Com.

The B.Com. program, consisting of a pre-Commerce year in another faculty and three 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 two and a half years are devoted to laying a foundation in the related sciences and the humanities, and to introducing the student to basic business issues, principles and practices.

The professional and specialized aspects of the curriculum are largely concentrated in the last one and a half years. Because of the breadth and variety of topics covered, all students must take a specified "core" of courses and then arrange a series of carefully selected and integrated courses to complete an option. The necessary core courses are set out in the *Calendar*. Students may contact the Commerce Undergraduate Office for more details concerning each option in the program.

Admission to the Bachelor of Commerce Program

The Faculty has been authorized to restrict enrolment in Commerce. It should be noted that because of the high demand for the B.Com. program, completion of minimum prescribed requirements does not guarantee admission. In most cases the competition for places is such that standing above the minimum prescribed requirement is necessary to ensure admission. **In evaluating applications, emphasis is placed on the pre-Commerce requirements of English, Economics, and Mathematics.**

In assessing applicants who have completed more than one year in other Faculties, emphasis will be placed on Commerce-related course work. Further details may be obtained from the Commerce Undergraduate Office. Students previously registered in the Faculty of Commerce who were required to discontinue or who failed their year will normally be considered in competition with other eligible candidates.

Admission from Another Faculty

Students who have completed a first-year university program of at least 30 credits on a full-time basis may apply for admission to the Commerce program. Applicants must have completed English 112 plus one of English 110, 111, 120, 121 (Arts One or the former English 100 is acceptable); Economics 100; Mathematics 140 and 141 (Mathematics 100 and 101 or 120 and 121 are acceptable alternatives); and 12 credits of electives. Electives must not include any business, statistics or activity courses. **Students are reminded that in planning their program they must comply with the requirements of the Faculty in which they are registered.**

Students who have completed a first-year university program, with no failures, but are deficient in one or more of the core courses may qualify for consideration in two ways: (1) attend a College and take a second-year Commerce transfer program which includes the deficient core course(s); or (2) continue to a second year at the university in a program that includes the deficient core course(s) and include further courses in English and Economics. Information on recommended courses may be obtained from the Undergraduate Office in the Faculty of Commerce and Business Administration. Students who have successfully completed 30 credits of pre-Commerce studies in Winter Session with a high academic average but

The Faculty of Commerce and Business Administration

The Faculty of Commerce and Business Administration offers courses leading to the degree of:

- Bachelor of Commerce (B.Com.)
- Master of Business Administration (M.B.A.)
- Master of Science in Business Administration (M.Sc. (Bus.Admin.))
- Doctor of Philosophy (Ph.D.)

who are deficient in one core course may apply to the Commerce Undergraduate Program Office for permission to complete the deficiency in Summer Session, Term I.

Admission from College Commerce Transfer Programs

Students who have completed second-year Commerce at a college offering a UBC transfer program are eligible to be considered for admission to third-year Commerce if their average is 60% (or equivalent) in the most recent year of studies. **Attainment of the minimum prescribed requirement means only that the applicant is eligible for selection but does not provide assurance of admission.**

Admission from Commerce Programs at other Universities

Commerce students attending other universities and wishing to transfer to the Faculty of Commerce and Business Administration at UBC will be considered on an individual basis. Students may be admitted with advanced standing as approved by the Director of Undergraduate Programs. Transfer credit will be assessed only after a formal application for admission to the program has been made. An average of at least 60 percent (or equivalent) is required to be considered for admission. Students who have been required to withdraw from another university will not be considered. Students who have been accepted into the Bachelor of Commerce program must be in attendance at UBC and registered in the Faculty for a minimum of two Winter Sessions.

Discretionary Admissions (B.C. Residents Only)

Mature students who may not meet the normal university or Faculty requirements for admission but who have relevant work experience may be considered for admission to the faculty but must first satisfy the pre-Commerce core course requirements. If accepted, mature students may be granted exemption from electives to a maximum of 12 credits. Enquiries should be made in writing to the Undergraduate Office in the Faculty of Commerce.

Admission from B.C. Grade 12 (or the Equivalent)

Graduates from grade 12 or grade 13 in any Canadian province are not admissible directly to the faculty. Applicants with such standing should apply for admission to first year university.

Application Deadlines

Students applying to enter the Faculty must make formal application to the Registrar of the University no later than April 30.

All necessary documents, including official transcripts, must be received by the Registrar's Office by June 30 to ensure that the application will be considered. Applicants should be aware that registration begins before this deadline.

Option Programs

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) Commerce and Economics
- 3) Finance
- 4) General Business Management
- 5) Industrial Relations Management
- 6) International Business
- 7) Management Information Systems
- 8) Marketing
- 9) Transportation and Logistics
- 10) Urban Land Economics

Dean's Honour Roll

The words "Dean's Honour Roll" will be placed on a student's transcript if an average of 80% or better has been achieved in the program of an academic year of at least 30 credits in any year. To qualify, a student must pass all courses.

Degree with Honours

The words "with Honours" will be placed on the transcript of record, and the degree certificate of a student graduating with the B.Com. degree where the average is 80% or better in the final two years of the program. As well, the student must be enrolled in a full course load in at least one of the two final years.

Unsatisfactory Performance

Students whose performance in the Faculty of Commerce and Business Administration is unsatisfactory will be required to discontinue study in the Faculty for at least one year. Students who have failed to meet the promotion requirements of the University will be considered to have failed the year and will be required to discontinue study in the University for at least one year.

- 1) Students will be required to discontinue study in the Faculty for at least one year if they:
 - a) pass all courses in which they are registered but achieve an average below 55%, or
 - b) fail one or more of the courses in which they are registered and obtain an average below 60% in the courses passed.
- 2) Students will be considered to have failed the year and will be required to discontinue study at the University for at least one year if:
 - a) they are registered in 30 or more credits and receive a failing grade in 12 or more credits, or
 - b) they are registered in less than 30 credits and receive a failing grade in one-third or more of the credits in which they are registered.
- 3) Course withdrawals without prior permission and which result in a "W" recorded on transcripts may be considered failures in determining advancement potential.
- 4) Students at any level of University study who are required for a second time to discontinue studies in the Faculty, whether in repeating a year or in a later year, will be required to withdraw from the University. Readmission to Commerce in such cases is normally not granted.
- 5) Students who fail the year or are required to discontinue study in the Faculty may apply for readmission only after 12 months.
- 6) Students who are readmitted after being required to discontinue study in the Faculty or after a failed year will receive credit towards the B.Com. degree only for those courses in that year in which a grade of at least 65% was obtained.
- 7) Any students whose academic records, as determined by the tests and examinations of the first term, are found to be unsatisfactory may be required to discontinue attendance in Commerce for the remainder of the session.

Supplementals

If a student's general standing in the final examinations of any year is sufficiently high, the Faculty may grant supplemental examinations to a maximum of six credits. Notice will be sent to all students to whom supplementals have been granted.

The following rules govern the granting of supplementals:

- 1) The Faculty may grant supplemental examinations to a maximum of six credits.
- 2) In order to be eligible for consideration a student must have obtained at least 40% in the course in question and an average of not less than 60% in all other courses taken during the session.

- 3) Supplemental examinations normally are provided in Commerce courses where the final examination accounts for 40% or more of the final grade in the course.
- 4) A supplemental examination will have essentially the same scope as the final examination, and will, when written and passed, stand as a substitute for the final examination in any calculation of the final course grade.
- 5) Information on courses that have supplemental examinations will be published in the Commerce Undergraduate Program Guide.

English Requirement

To qualify for the degree of Bachelor of Commerce, students must satisfy the English requirement of the Faculty of Commerce and Business Administration. To do this, students must obtain credit for English 112 plus one from English 110, 111, 120, or 121. Satisfactory completion of the Language Proficiency Index (LPI) examination is prerequisite to all first-year English courses at UBC. (See *Calendar* index under "Language Proficiency Index".) Students who complete Arts One (or the former English 100) will also be deemed to have satisfied the Faculty of Commerce English requirement.

The Faculty of Commerce English requirement must be completed within one year of entry to the Faculty. Students who do not satisfy these requirements within one year will be required to discontinue their studies in the Faculty. They may apply for readmission once the requirement is satisfied.

Degree Completion

Students must complete their degree requirements within six years of their original admission into the Faculty of Commerce and Business Administration.

Regulations Regarding Commerce Courses

- 1) Students are admitted to the B.Com. program, not to particular options and enrolment in required option courses may be constrained. Students may select their field of concentration (option) in the summer registration period prior to third year but must make their choice no later than the end of Term 1 of Winter Session of the third year in the program. While it is possible to try to change options at the end of the first term there may not be sufficient room in all of the required courses. Because TELEREG access is on a merit basis, students with lower marks will register later and may be unable to gain admission to the option of their first choice. For this reason students are encouraged to plan for a second and third choice. Changes to options made at the end of the first term require the approval of the Director of the Undergraduate Program.
- 2) Each option program assumes that there is a normal sequence of courses, as listed in the Commerce Undergraduate Program Guide. Students are expected to recognize these normal sequences in planning their program. Any exceptions must be approved by the Director of the Undergraduate Program.
- 3) Students may be required to undertake field work in the business community.
- 4) A charge may be made for material supplied by the Faculty for use in classes.
- 5) Courses in Commerce generally are reserved for students registered in a degree program in Commerce.

However, there are exceptions to this general regulation. Special registration arrangements have been made for students registered in other Faculties in programs, as approved by Senate, which specifically require Commerce courses.

- 6) Students who have obtained a first class average in their third year may elect to register for up to six credits of 500-level courses chosen in consultation with the Chairman of the Division, the instructor and the Director of the Undergraduate Program.

Program Approval

Students are reminded of the university rule regarding program responsibility. Students are responsible for the completeness and accuracy of registration as it relates to the regulations of the program in which they are enrolled. Any variation from a full load must be approved by the Director of the Undergraduate Program.

Prerequisites

The required 200-level Commerce courses generally are prerequisite to 300- and 400-level courses in the same option area. In each option, it is assumed that the required 300-level courses will be taken prior to the 400-level courses. Students should contact the Undergraduate Office for specific information about course prerequisites and variations from normal program sequences.

Any student not registering for a normal sequence of courses must consult the Director of the Undergraduate Program.

Non-Commerce students taking Commerce courses as a part of a program should contact the Undergraduate Office for information. Prerequisites are not generally shown in the course listings but are outlined in the Commerce Undergraduate Program Guide.

Electives

Electives are chosen to complement the choice of option as well as to broaden the student's general education. Many senior level courses require junior prerequisites so students should select lower level electives carefully. At least nine credits of 300- or 400-level electives must be taken in a Faculty other than Commerce in the third and fourth years combined. All electives in the third and fourth year, whether Commerce or non-Commerce, must be at the 300-level or higher. Any exceptions must be approved by the Director of the Undergraduate Program. Courses that are not appropriate for elective credit are outlined in the Commerce Undergraduate Program Guide.

Program Requirements

The following program requirements represent the core courses of the B.Com. degree. In addition students in Third Year must select an Option and complete the specific Option Program Requirements set out below.

First Year: 30 credits

- ENGL 112 plus one from ENGL 110/111/120/121 (or ENGL 100)
- ECON 100
- MATH 110, 111¹
- 12 credits of non-Commerce Electives

¹ Acceptable alternatives are MATH 100, 101, or 120, 121. Students planning to complete the Management Information Systems option must take MATH 100, 101 or 120, 121.

Second Year: 34 credits

- COMM 295 (or ECON 201 or ECON 206 or AGECE 295)²
- COMM 290, 291, 292, 293, 294, 297, 299

- COMM 392 or 396
- six credits of non-Commerce electives

¹ Most fourth year economics courses require ECON 201, or 206 as a prerequisite, and students who intend to take such courses should enrol in one of these. Additionally, ECON 202 or 303 may be prerequisites for some fourth year economics courses. Students planning to pursue the Commerce and Economics option must enrol for ECON 201, or 206.

Third Year: 32 credits

- COMM 391, 394, 397
- COMM 396 or 392 (whichever was not taken in second year)
- One of COMM 393 or 399 (secondary core)¹
- nine credits of electives, including at least three credits of non-Commerce electives²
- six credits of Option requirements (as specified below)

Fourth Year: 30 credits

- one of COMM 491, 497, or 498
- One additional course from the following list (secondary core)¹
- COMM 393
- COMM 399
- COMM 491, or 492, or 493, or 494, or 497, or 498³
- 15 credits of electives, including at least six credits of non-Commerce electives²
- nine credits of Option requirements (as specified below)

¹ Students take two courses in the secondary core - generally one in year three and one in year four.

² The B.Com. degree requires a minimum of nine credits of non-Commerce electives in third and fourth years combined. Additional electives in third and fourth years may be either Commerce or non-Commerce courses. Please refer to section on Electives for more information.

³ Students must take one course from COMM 491, 497 or 498 as part of the "core" requirements in the Fourth year. An additional course may be chosen from COMM 491, 492, 493, 494, 497, or 498 to satisfy one of the two requirements of the "secondary core." The 49X series of courses can only be taken in the fourth year.

Third and Fourth Years Option Requirements

Accounting

Third Year

- COMM 353, 354
- nine credits of electives including three credits of non-Commerce electives

Fourth Year

- COMM 450, 453, 454
- 15 credits of electives including six credits of non-Commerce electives

Commerce and Economics

Second Year

- ECON 201 or 206

Third and Fourth Years Combined

- ECON 303
- six credits of 300- or 400-level Economics
- nine credits of 400-level Economics
- six credits of 300- or 400-level Commerce
- 15 credits of electives including nine credits of non-Commerce electives

Note: Students completing an option in Commerce and Economics may not take Economics courses as their non-Commerce electives. Commerce and Economics students

must take ECON 201 or 206, rather than COMM 295, as the former are prerequisites to several higher-level economics courses. ECON 202 is highly recommended as an elective.

Finance

Third Year

- COMM 371, 374
- three credits from: COMM 376, 377, 378, 379
- six credits of electives, of which at least three credits must be non-Commerce electives

Fourth Year

- six credits from: COMM 471, 472, 475, 478
- 18 credits of electives of which at least six must be non-Commerce electives

Note: Credit will not be given for both ECON 345 and COMM 376.

General Business Management

Third Year

- COMM 393, 399¹
- three credits from: COMM 309, 310, 320, 335, 349, 353, 354, 363, 371, 374, 410, or 411
- 9 to 12 credits of electives, including at least three credits of non-Commerce electives

Fourth Year

- nine credits from: COMM 491, 492, 493, 494, 497, or 498, including at least three credits from COMM 497 or 498
- at least three credits of 400-level coursework built on COMM 309, 310, 320, 335, 349, 399, 353, 354, 363, 371, 374, 410, or 411
- 15 to 18 credits of electives, including at least six credits of non-Commerce electives²

¹ General Management option students take courses in all three functional areas of the secondary core. Two of these courses count as secondary core requirements, and one as a general management option requirement. One of COMM 393 or 399 may be taken in fourth year.

² General Management students are restricted to taking no more than nine credits of coursework beyond the core in any specific option area.

Industrial Relations Management

Third Year

- COMM 327, 328
- nine credits of electives including three credits of non-Commerce electives

Fourth Year

- COMM 421, 427, 428
- 15 credits of electives including six credits of non-Commerce electives

International Business

Third and Fourth Years Combined

- 15 credits of approved 300 and 400-level Commerce courses¹
- 24 credits of approved electives to complete option requirements specified below

This option has very limited enrolment. Students must apply to the option and meet the criteria for acceptance which includes, achieving a first-class average in the first two years of their program. By the end of the program students must have:

- 1) completed at least six credits of language study at the 300-level (or equivalent);
- 2) taken at least 18 credits of approved area studies in (a) politics (b) history and culture, (c) economics, and (d) language.

Students contemplating entering this option should consult with the Director of Undergraduate Programs at the earliest possible date to ensure that prerequisites for the language study and other required courses are taken at the earliest possible time.

¹ Nine of the 15 credits must be internationally oriented courses.

Management Information Systems

Third Year

- COMM 391 (First term)
- COMM 437 (Second term)
- 12 credits of electives, at least three of which must be non-Commerce

Fourth Year

- COMM 335, 436, 438, 439
- 12 credits of electives including
- six credits of non-Commerce electives

Note: Strongly recommended non-Commerce electives include: CPSC 124, 126, 216, 218, 220, 310, and 319. Students should take note of the prerequisites required for the above Computer Science courses.

Marketing

Third Year

- COMM 362, 363
- nine credits of electives including three credits of non-Commerce electives

Fourth Year

- COMM 365, 468
- three credits from: COMM 460, 461, 462, 463, 464, 466, 467, 469
- 15 credits of electives including 6 credits of non-Commerce electives

Transportation and Logistics

Third Year

- COMM 349, 394¹, 399²
- 12 credits of electives including 6 credits of non-Commerce electives

Fourth Year

- COMM 441, 447, 449
- three credits from COMM 444, 445
- 12 credits of electives including six credits of non-Commerce electives

¹ Special section of Commerce 394 required.

² COMM 399 should be taken as one of the student's two choices for "secondary core" courses, as it is a prerequisite for COMM 441, required in fourth year.

Note: Students are strongly encouraged to take ECON 480.

Urban Land Economics

Third Year

- COMM 307, 309
- nine credits of electives, including at least three credits of non-Commerce electives

Fourth Year

- COMM 407, 408
- COMM 406 or 409
- 15 credits of electives including six credits of non-Commerce electives

Note: Recommended electives: COMM 434, 471, ECON 447 or PLAN 425; one of COMM 376 or ECON 345.

Students Who entered Program prior to September 1993

Students who registered initially in the B.Com. program prior to September 1993, should see the Director of the Undergraduate Program regarding the requirements to complete the B.Com. degree.

The Entrepreneurship and Venture Capital (EVC) Research Centre

Director: R. Amit, Associate Professor

The EVC Research Centre is housed in the Faculty of Commerce and Business Administration. The Centre serves as a catalyst for innovative ideas in entrepreneurship and new venture creation. Through research and business participation, the Centre provides constructive support on a variety of issues and challenges facing companies, individual entrepreneurs and government policymakers.

Directed at Commerce students, the Centre offers the Entrepreneurship Experience Program, a "hands on" program providing students with the opportunity to integrate and apply theoretical concepts in "real life" settings with local entrepreneurs.

The 26-member Advisory Board of the EVC Research Centre includes founders and presidents of knowledge-based ventures, family owned businesses, venture capital firms, accounting and law firms as well as women entrepreneurs and representatives from provincial and federal government agencies.

The Centre for Labour and Management Studies

Director: T. Knight, Associate Professor

The Centre for Labour and Management Studies is housed in the Faculty of Commerce and Business Administration. The Centre was established to undertake theoretical and applied research on issues related to work, employment and productivity and their relationship to global competitiveness. The Centre supports the development of innovative responses to these issues in organizations and public policy and disseminates the results of research and innovations among the relevant academic, labour, management and government communities of British Columbia and Canada.

The Centre supports the incorporation of materials and findings generated through research and other activities within existing and new courses and programs of the Faculty of Commerce and Business Administration.

The Centre draws upon research expertise from the academic, management, labour and government communities through its Advisory Board and Research Associate appointments.

Professional Associations**Institute of Chartered Accountants of B.C.**

After obtaining employment with an approved firm of Chartered Accountants:

- 1) Graduates of the Accounting Option are required to complete not less than 33 months of registered employment and the program of the School of Chartered Accountancy conducted by the Institute in order to obtain the C.A. designation.
- 2) Graduates, other than those mentioned in (1), above, are required to complete the required prerequisite courses before being admitted to the School of Chartered Accountancy. These prerequisite courses are available through the G.A.P. program described later, for candidates possessing a recognized undergraduate degree.

Certified General Accountants Association of B.C.

- 1) Graduates of the B.Com. program (non-Accounting option) may be granted certain exemptions on the C.G.A. program.
- 2) Graduates with the degree of B.Com., Accounting Option, may be granted additional advance standing toward the C.G.A. designation.

Society of Management Accountants of B.C.

- 1) Graduates of the B.Com. program Accounting Option will be granted maximum exemptions toward the CMA designation. Students enrolling in this program should consult the Society of Management Accountants or the student bulletins available on campus for detailed exemption information.
- 2) Graduates of the B.Com. program, in any option other than Accounting, will be granted exemptions to the extent that comparable courses have been completed at the University.
- 3) A period of practical experience is required to qualify as a registered member of the Society and at a minimum this will be two years.

Real Estate Institute of B.C.

Graduates of the B.Com. Program, Urban Land Economics Option will have satisfied the Educational requirements for membership in the Real Estate Institute of British Columbia. Full membership in the Real Estate Institute of B.C. will require a minimum of three years, continuous experience in a Real Estate related activity. Acceptance into the Real Estate Institute of B.C. entitles members to use the distinguishing letters R.I.(B.C.) after their names.

Student Membership: All students enrolled in the B.Com. Program, Urban Land Economics Option are entitled to apply for student membership in the Real Estate Institute of B.C. Enquiries may be directed to the Executive Officer.

Professional and Diploma Courses

The Faculty operates a number of programs in the professional and managerial fields. Most programs require detailed study over a period of several years at part-time or evening classes. In some cases, correspondence lessons are available. Completion of assignments and examinations is required in most subjects.

Admission requirements vary from program to program. In some cases, registration is limited to residents of the Province of British Columbia.

The Certified General Accountants of British Columbia

A five-year evening lecture program designed to meet the academic requirements of the Certified General Accountants Association of British Columbia.

Sales and Marketing Management Program

A three-year, evening lecture program sponsored by the Sales and Marketing Executives of Vancouver, and leading to a diploma in Marketing and Sales Management.

The Graduate Admission Program of the Institute of Chartered Accountants of British Columbia

A part-time, lecture program providing the prerequisite courses necessary for entry into the School of Chartered Accountancy.

Real Estate Courses**Real Estate Salesperson's and Sub-Mortgage Broker's Pre-Licensing Course**

A correspondence course meeting the academic requirements for licensing as a real estate salesperson or sub-mortgage broker in the Province of British Columbia.

The Real Estate Agent's Pre-Licensing Course

A correspondence or lecture course meeting the educational requirements for licensing as a real estate agent in the Province of British Columbia.

Mortgages: A Real Estate Financing Course

A correspondence course meeting the requirements for licensing under the British Columbia Mortgage Brokers Act.

The Diploma Program in Urban Land Economics

A four year correspondence program in advanced real estate studies.

Certificate Program in Real Property Assessment

A two-year correspondence program dealing with assessment-specific topics with a focus on computer assisted mass appraisal techniques.

British Columbia Society of Notaries Public Preparatory Course

A one-year correspondence program which forms part of the academic requirements for consideration as a member of the Society.

Market Value Appraiser (Residential) Program

Three correspondence courses which meet the academic requirements for using the distinguishing letters M.V.A. after one's name

Executive Programs

Executive Programs offer a variety of short-term, managerial seminars in all disciplines of business administration. Seminars are regularly scheduled at the University of British Columbia, and are also offered on an in-house or customized basis to interested organizations.

Academic Staff

Office of the Dean

- MICHAEL A. GOLDBERG, B.A. (Brooklyn College), M.A., Ph.D. (Calif., Berkeley), Herbert R. Fullerton Professor of Urban Land Policy and Dean.
- DEREK R. ATKINS, B.A. (Oxon), M.Sc. (Lanc.), Ph.D. (Warw.), Professor and Associate Dean, Academic Programs and Student Services.
- GERALD J. GORN, B.A. (Sir Geo. Williams), M.Sc. (London Sch. of Econ.), Ph.D. (Penn. State), Advisory Council Professor of Consumer Behaviour and Associate Dean, Faculty Development.
- ETHEL DAVIS, B.H. Ec. (Man.), M.B.A. (W. Ont.), Assistant Dean and Director of Masters' Programs.
- DANIEL F. GARDINER, B.A. (W. Ont.), M.A. (Queen's), M.B.A. (Brit. Col.), Ph.D. (W. Ont.), Assistant Dean, Senior Instructor and Director of Undergraduate Program.
- GRACE WONG, B.Ed., M.B.A. (Brit. Col.), Assistant Dean and Director, International Programs.

Professors

- RAPHAEL AMIT, B.A., M.A. (Hebrew), Ph.D. (Northwestern), Peter Wall Distinguished Professor of Entrepreneurship and Venture Capital, and Director, Entrepreneurship & Venture Capital Research Centre.
- DEREK R. ATKINS, B.A. (Oxon), M.Sc. (Lanc.), Ph.D. (Warw.), Professor and Associate Dean, Academic Programs and Student Services.
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- ANTHONY E. BOARDMAN, B.A. (Kent), Ph.D. (Carnegie-Mellon).
- JAMES A. BRANDER, B.A. (Brit. Col.), M.A., Ph.D. (Stan.), Asia Pacific Professor of International Business and Public Policy.
- SHELBY L. BRUMELLE, B.S. (Cal Tech.), M.S., M.A., Ph.D. (Calif., Berkeley), Chair of the Management Science Division.
- PIET DE JONG, B. Ec. (Sydney), Ph.D. (LaTrobe).
- BJORN E. ECKBO, B.S. (Norway), M.S., Ph.D. (Rock).
- GERALD A. FELTHAM, B.Com. (Sask.), Ph.D. (Calif., Berkeley), C.A., Arthur Andersen & Co. Professor of Accounting, and Chair of the Accounting Division.
- JAMES D. FORBES, B.S. (Wash. State), M.B.A. (Harv.), Ph.D. (Calif., Los Angeles).
- PETER J. FROST, B.Sc. (Witw.), M.Sc. (S.A.), Ph.D. (Minn.), Edgar F. Kaiser Professor of Organizational Behaviour.
- MICHAEL A. GOLDBERG, B.A. (Brooklyn Col.), M.A., Ph.D. (Calif., Berkeley), Herbert R. Fullerton Professor of Urban Land Policy and Dean of the Faculty.
- GERALD J. GORN, B.A. (Sir Geo. Williams), M.Sc. (London Sch. of Econ.), Ph.D. (Penn. State), Advisory Council Professor of Consumer Behaviour and Chair of the Marketing Division.
- DANIEL GRANOT, B.Sc., M.Sc. (Technion, Israel), Ph.D. (Texas), Affiliates Professor of Management.
- FRIEDA GRANOT, B.Sc., M.Sc. (Technion, Israel), Ph.D. (Texas), Advisory Council Professor in Management Science.
- NOEL A. HALL, B.Com. (Brit. Col.), M.B.A. (Calif.), D.B.A. (Harv.), Professor (on leave).
- TREVOR D. HEAVER, B.A. (Oxon), M.A., Ph.D. (Indiana), Director, Centre for Transportation Studies, UPS Foundation Professor of Transportation, and Chair of the Transportation, Logistics and Public Utilities Division.
- ROBERT L. HEINKE, B.S. (Calif. State, Hayward), M.B.A., Ph.D. (Calif., Berkeley), A.E. Hall Professor of Finance.
- ALAN KRAUS, B.A. (C'neil.), M.B.A. (Stan.), Ph.D. (C'neil.), Advisory Council Professor of Finance and Director, Ph.D. Program.
- MAURICE D. LEVI, B.A. (Manc.), M.A., Ph.D. (Chic.), Bank of Montreal Professor of International Finance.
- KENNETH R. MACCRIMMON, B.S., M.B.A., Ph.D. (Calif., Los Angeles), E. D. MacPhee Professor of Management.

- J. KEITH MURNIGHAN, B.A., M.S., Ph.D. (Purdue), W. J. Van Dusen Professor of Management.
- MASAO NAKAMURA, B.S., M.S. (Keio), Ph.D. (Johns H.).
- TAE HOON OUM, B.Com. (Sung Kyun Kwan, Seoul), M.B.A., Ph.D. (Brit. Col.), Van Dusen Professor of Business Administration.
- CRAIG C. PINDER, B.A. (Brit. Col.), M.A. (Minn.), Ph.D. (C'neil.).
- RICHARD W. POLLAY, B. Mgt. Eng. (Rensselaer Polytechnic Inst.), M.B.A., Ph.D. (Chic.).
- MARTIN L. PUTERMAN, A.B. (C'neil.), M.S., Ph.D. (Stan.), Advisory Council Professor of Management.
- MAURICE QUEYRANNE, M.Sc., Ph.D. (Grenoble).
- BERNHARD SCHWAB, B.S., M.S. (Tech. U. of Munich), M.B.A., Ph.D. (Calif.).
- DAN A. SIMUNIC, B.S., M.B.A. (DePaul), M.B.A., C.P.A. Professor of Accounting, Ph.D. (Chic.), C.P.A.
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- WILLIAM T. STANBURY, B.Com. (Brit. Col.), M.A., Ph.D. (Calif., Berkeley), UPS Foundation Professor of Regulation and Competition Policy.
- MARK THOMPSON, B.A. (Notre Dame), M.S., Ph.D. (C'neil.), William M. Hamilton Professor of Industrial Relations.
- ILAN VERTINSKY, B.A. (Hebrew), Ph.D. (Calif., Berkeley), Vinod Sood Professor of International Business Studies and Director, Centre for International Business Studies.
- DONALD A. WEJRUNG, A.B. (Dartmouth), M.Sc., Ph.D. (Stan.).
- CHARLES B. WEINBERG, Sc.B. (Brown), M.B.A. (Harv.), Ph.D. (Col.), Alumni Professor of Marketing.
- JOSEPH T. WILLIAMS, A.B. (Williams Col.), A.M. (Stan.), Ph.D. (Harv.).
- WILLIAM T. ZEMBA, B.S. (Mass.), M.B.A., Ph.D. (Calif., Berkeley), Professor and Alumni Professor of Management Science.

Associate Professors

- MERLE E. ACE, B.S. (St. Lawrence), M.A. (Col.), Ph.D. (Minn.).
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- STANLEY W. HAMILTON, B.Com. (Sask.), M.B.A. (Brit. Col.), Ph.D. (Calif., Berkeley).
- ROBERT HELSLEY, B.S. (Oregon), M.A., Ph.D. (Prin.), Chair of the Urban Land Economics Division.
- P. DEVEREAUX JENNINGS, B.A. (Dartmouth), M.A., Ph.D. (Stan.).
- LAWRENCE D. JONES, B.A., M.A. (Ohio State), Ph.D. (Harv.).
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- CARSON WOO, B.Sc., M.Sc., Ph.D. (Tor.).

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- DANIEL F. GARDINER, B.A. (W. Ont.), M.A. (Queen's), M.B.A. (Brit. Col.), Ph.D. (W. Ont.), Senior Instructor, Assistant Dean and Director of Undergraduate Program.

Lecturers

- STEVE S. ALISHARAN, B.A. (Brit. Col.), C.A., C.M.A.
- MARY-ANN BOOTH, B.Com., LL.B. (Brit. Col.).
- JOHAN P. DE ROOY, B.Ed. (Brit. Col.), M.B.A. (Queen's), C.A.
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Division of Urban Land Economics:

- R. Helsley, Chair; M. A. Goldberg, S. W. Hamilton, I. D. Jones, S. Rosenthal, C. T. Somerville, W. Strange, J. Williams.

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Introduction

The mission of The School of Community and Regional Planning is to advance the transition to sustainability through excellence in integrated policy and planning research, professional education and community service.

The School offers an integrated approach to planning for development. Students concentrate their studies in one of the following three areas, but may take courses in other concentrations, other departments or other universities.

- **Community Development Planning:** programs focus on physical planning and design; real property development and planning; community development; urban policy planning; urban social issues; housing policy planning; and small town planning. Students participate in hands-on workshops that focus on current community development issues.
- **Regional and Natural Resources Planning:** programs focus on natural resources planning and management; ecological theory for sustainable development; ecological economics; environmental policy and decision-making; resource conflict resolution.
- **International Development Planning:** programs focus on human settlements in the developing world.

The Environment for Teaching, Learning and Research

Our program of teaching and research strikes a balance between developing the competence required to enter professional practice today, and the intellectual preparation needed to continue to function adequately in increasingly responsible positions in a rapidly changing world. The program covers the substance and methods of community, urban, regional and natural resources planning as well as the process and institutional arrangements for planning, its ideological basis, and the role and ethical responsibility of the planner. We are interested in the solution to today's problems as well as anticipating and shaping the future through policy relevant scholarly research.

From the student's point of view, our program has the following salient characteristics:

- opportunities for students with an undergraduate degree in a limited field to broaden their knowledge in order to assume responsibilities in planning and management;
- opportunities for students with a generalist's background to acquire greater disciplinary rigour in a planning-related field of their choice;
- flexibility within a structured format to design a program of studies to satisfy individual needs;
- an emphasis on formal course work, balanced with directed studies, and original thesis research;
- opportunities for joint student-faculty research and publication.

Students are encouraged to become involved in the activities of the University's several research institutes and to enrol in relevant graduate courses in other departments. In resource management there is the Westwater Research Centre, the Sustainable Development Research Institute, and the Resource Management and Environmental Studies program; in transportation, the Transportation Centre; and in developing countries issues, the Institute of Asian Research.

The School's Centre for Human Settlements (CHS), designated a "Centre for Excellence" in 1991/92 by the Canadian International Development Agency, further strengthens our research capability in urban and regional development, housing, urban governance, and community devel-

The School of Community and Regional Planning

A School within the Faculty of Graduate Studies.

The School of Community and Regional Planning offers a two year professionally oriented Master's Degree program and a research oriented Ph.D. program.

opment planning in both the developed and developing world. The Centre also houses the Disaster Preparedness Research Centre which is organizing, The Pan Pacific Hazards '96 Conference. Further information on CHS is listed a separate section of the *Calendar*.

History

The School of Community and Regional Planning graduated its first students in 1953, and has continuously offered a two-year Master's degree in planning longer than any other Canadian school. Over 600 graduates are employed throughout Canada and abroad in a wide variety of teaching, research, planning, policy analysis, and administrative positions in universities, municipal, provincial and federal, governments, public and private corporations, and in consulting practices. Many graduates are employed as generalists particularly in municipal and regional planning agencies, but an increasing number are found in more specialized fields such as housing, parks, transportation, social planning and urban design, in urban planning; and environmental protection, water resources, land management, northern and native programs in regional development and natural resources planning. A significant number of graduates are engaged in international activities in a variety of public and private sector agencies, companies and departments.

The Master's degree will be either a Master of Arts (Planning) or a Master of Science (Planning), whichever best describes the prerequisites offered by the candidate and the courses chosen.

Application for Admission

A complete application for admission includes:

- 1) An application by the candidate on a form available from the School.
- 2) Three confidential recommendations on the candidate's academic qualifications. Forms for this purpose are provided with the application and must be sent directly to the School by the referee. Applicants with professional experience are encouraged to solicit additional letters of recommendation.
- 3) Official transcripts of all academic work sent directly to the School.
- 4) A typewritten statement of up to 500 words indicating why the applicant wishes to study planning, the proposed study focus and how the School will help to meet the candidate's objectives.
- 5) Official TOEFL results, if required.
- 6) Application fee.
- 7) Other forms distributed by the School to applicants.

Those whose native language is not English and whose previous degree was not earned in an English-speaking university accepted by the Faculty of Graduate Studies must complete the Test of English as a Foreign Language, given four times annually in most major cities. A score of 600 is required. For further information write: TOEFL, Box 899, Princeton, New Jersey, U.S.A., 08540. Make special note of instructions on the graduate application form under section "Special Examinations".

For a brochure, write to: The Director, School of Community and Regional Planning, The University of British Columbia, 433 - 6333 Memorial Road, Vancouver, B.C., Canada, V6T 1Z2. Requests may also be made by telephoning (604) 822-4422. All documents and the appropriate application fee should be returned to the above address.

The deadline for submitting complete applications is January 15.

Prerequisites for Admission

Admission to the Master's Degree program requires a four year Bachelor's degree with high academic standing. Students are accepted from both the social sciences and the natural sciences, the humanities, and from such fields as commerce, architecture, engineering, agriculture and forestry. Students from other fields are accepted but may be required to fulfil additional prerequisites.

Prospective students are encouraged to follow an honours or major program in their own discipline and develop some breadth of knowledge during their undergraduate program by selecting from courses in ecology, economics, geography, political science, history, sociology, and organizational development and behaviour. All students are required to have successfully completed undergraduate courses in both economics and statistics prior to admission.

The UBC course recommended to meet the economics requirement is one of the following: Economics 100 or 309; to satisfy the statistics requirements it is suggested that students take either a statistics course in their undergraduate discipline or Statistics 203.

A candidate who has taken graduate courses equivalent to those described for the Master's degree may be given credit not to exceed 12 credits for courses completed in the year prior to commencing their programs in the School.

Students who do not make satisfactory progress in the program may be asked to withdraw at any time, and the status of all students who have not completed the pro-

gram within the prescribed two-year period will be reviewed annually thereafter.

About 30 students are admitted annually. We seek highly motivated applicants who can communicate effectively, who are challenged by a field marked by complexity, who are creative, and have the potential to provide leadership.

Curriculum

The Master's degree is awarded upon satisfactory completion of a program consisting of 60 credits, including a thesis, over two academic years. Those students who wish to develop a strong specialization may satisfy a significant proportion (up to 12 credits) of this requirement through courses in other departments.

The thesis is valued at 12 credits but several regular courses may be used to develop the thesis proposal, research method, and data analysis.

A program of studies will normally be comprised as shown below.

Prerequisites

These cannot be credited toward the Master's degree, and must be completed prior to admission:

- economics
- statistics

Orientation

All entering students are required to attend orientation sessions prior to the commencement of Term 1 of Winter Session to become acquainted with faculty and fellow students and to examine typical urban, regional and resource planning problems in B.C.

1) Foundation Courses

These courses provide a breadth of knowledge covering: the social, economic, and ecological context for urbanization, regional development, and resource planning; the institutional arrangements for planning; and theories of the planning process.

2) Methods Courses

Planners have a major responsibility for generating, analyzing and presenting information for the decision-making process. All students require basic skills in planning analysis. Appropriate courses outside the School may be substituted.

3) Substantive Courses

These courses provide depth of knowledge within one of the concentrations offered by the School. Courses taken in other departments should be complementary and choices should be related to thesis research interests.

4) Workshops

These courses provide an opportunity for students to apply their knowledge and skills to planning problems under circumstances that simulate professional practice.

5) Thesis Research

Students are required to prepare a thesis in their second year on a subject of their choice. The fullest benefit of this research is derived by those students who relate their overall program of studies to their thesis subject area.

**Best wishes to the Faculty,
Staff and Students**
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Ph.D. Program

Application Procedure

The School offers a Ph.D. program for advanced study and research in the areas of its competence. The Ph.D. is primarily a research degree, so that students should enter with a good background in their field of study. After two years of course work and examinations, candidates devote their efforts toward thesis research.

Applicants for admission must have a Master's degree in planning, or its equivalent, with high academic standing.

To ascertain our ability to fulfil potential candidates' objectives, we require a statement of about 1,000 words describing their research interests and objectives which should be submitted with the request for application forms.

For a brochure, write to: The Director, School of Community and Regional Planning, The University of British Columbia, 433-6333 Memorial Road, Vancouver, B.C., Canada, V6T 1Z2. Requests may also be made by telephoning (604) 822-3276. All documents and the appropriate application fee should be returned to the above address.

Advisory Committees

Committees consist of a prospective research supervisor and three other faculty members to advise students and approve their programs of studies. At least one member of each committee is from a discipline other than Planning. Membership in the committee may change as the student's program evolves, but it is formalized on final approval of the thesis proposal.

Program of Studies

Each Ph.D. candidate's program is designed by the candidate's advisory committee in consultation with the student to reflect individual requirements.

The program of studies will normally include:

- 1) course work;
- 2) qualifying examination in the form of two research essays;
- 3) language requirement, at the discretion of the faculty, appropriate to the student's objectives;
- 4) approval of thesis outline;
- 5) research and preparation of thesis;
- 6) oral presentation of thesis and final examination of the candidate.

The first year of the Ph.D. program usually involves course work in preparation for the qualifying examination and development of the research prospectus. Additional courses may be necessary in the second year, in support of the proposed thesis research. Specific requirements are left to the discretion of the candidate's committee in consultation with the candidate.

Ph.D. candidates normally write their qualifying essays in the second year. These focus on planning theory, and issues and methods in the student's area of specialization. Course requirements should be completed by this time.

Students who successfully complete their qualifying essays will then finalize their thesis research prospectus in consultation with their advisory committee. After the prospectus has been approved the candidate's efforts are devoted to research and preparation of the thesis.

Dissertation Requirements

The Faculty of Graduate Studies requires the thesis to be submitted to an External Examiner or Examiners appointed by the Dean and at the completion of the research the candidate must take an oral examination in defence of the dissertation.

Certificate in Site Planning

This part-time, two-year certificate program offered by the School prepares qualified students for specialized professional practice in urban site planning focussing on the residential environment.

The admission requirement is a Bachelor's Degree or a two-year technical institute certificate in a related discipline, membership in a related professional association, or secondary school graduation and evidence of substantial experience in site planning or subdivision design.

The certificate is awarded on completion of 18 credits of site planning course work with not less than second class standing in each course.

For further information write to Certificate in Site Planning, Community and Professional Programs, School of Community and Regional Planning, The University of British Columbia, 6333 Memorial Road, Vancouver, B.C. V6T 1Z2.

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M. C. HEALEY, B.Sc., M.Sc. (Brit. Col.), Ph.D. (Aberd.).
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DAVID LOUKIDELIS, M.A. (Edin.), LL.B. (Osgoode), B.C.L. (Oxon).
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RAY SPAXMAN, Dip. Arch. (Nort.), Dip. Tp. (Birm.).

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Introduction

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 Dean of the new Faculty was appointed in July, 1962, and a small class of undergraduate dental students was admitted in September, 1964.

The teaching, research and clinical facilities are housed in the Dental Health Sciences building which was named the John Barfoot Macdonald Building. These facilities have been designed as part of the Health Sciences Centre to promote integrated teaching of the health services team. Instruction in the basic health sciences is provided by the appropriate basic science departments under the joint administration of the Faculty of Medicine and Faculty of Dentistry. Library facilities are provided in the Woodward Biomedical Library.

The latest concepts in educational methodology, research and training are applied in the care of patients attending the dental clinic. In addition to graduate and postgraduate programs which are also provided, there is strong emphasis on the development of the Continuing Dental Education Program for the profession. This is provided as an integral part of the Health Sciences Program which comes under the jurisdiction of the Coordinator of the Health Sciences.

Doctor of Dental Medicine D.M.D.

Objectives

The Doctor of Dental Medicine degree program is designed to prepare students to practise their chosen profession with a high degree of technical skill based on a sound knowledge of the related biological sciences, and to make them aware of the interaction of the dentist as a health professional in the community.

Admission

Admission to the Faculty of Dentistry is based primarily on academic ability, place of residence, 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.

The fulfilment of the minimum requirements for admission does not guarantee acceptance. Candidates who meet admission requirements but are not successful in gaining a place in the first year class with their initial application may reapply for admission in a subsequent year. However, reapplications from candidates who have already applied unsuccessfully on three previous occasions are not normally accepted, and the number of interviews is normally limited to two.

Application forms and information regarding pre-dental requirements, tuition and fees may be obtained from the Office of the Dean, Faculty of Dentistry, 350-2194 Health Sciences Mall, The University of British Columbia, Vancouver, B.C., V6T 1Z3. The deadline for applications each year is December 15 for admission the following September and the earliest date for applying is August 1 of the previous year. As application deadlines will be strictly enforced, applicants are reminded to allow sufficient time for application forms to reach the University.

The Faculty of Dentistry

The Faculty of Dentistry offers four degrees, Doctor of Dental Medicine (D.M.D.), Master of Science in Dental Science (M.Sc.), Doctor of Philosophy in Oral Biology (Ph.D.), and Bachelor of Dental Science – Dental Hygiene Diploma degree completion program (B.D.Sc.), as well as Postgraduate Specialty Training Programs in Periodontics, Oral Medicine, Oral Pathology and Oral Radiology. Detailed information on these programs is given at the end of the section on Dentistry. Information concerning the M.Sc. (Dental Science) and Ph.D. in Oral Biology may be found in the Graduate Studies section of the *Calendar*.

Predental Requirements

The requirements listed below apply to the student taking 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:

- 1) ENGL 112 (Strategies for University Writing) plus one elective chosen from:

ENGL 110 (Approaches to Literature), ENGL 111 (Approaches to Non-fictional Prose), ENGL 120 (Literature and Criticism), ENGL 121 (Introduction to Literary Theory)

Note: Satisfactory completion of the Language Proficiency Index (LPI) is prerequisite to all first-year English courses at UBC. (See *Calendar* index under Language Proficiency Index.)

- 2) MATH 100 (Calculus I) and MATH 101 (Calculus II)
or MATH 111 (Elementary Calculus)*
or MATH 130 (Finite Mathematics)
- 3) (the former CHEM 120)
CHEM 103 (General Chemistry)
or CHEM 110 (Principles of Chemistry)
or CHEM 121 (Structural Chemistry, with Application to Chemistry of the Elements)
and CHEM 122 (General Chemistry)
- 4) CHEM 203 or 230 (Organic Chemistry)
- 5) BIOC 300 (Principles of Biochemistry)
or BIOL 201 (Cell Biology II) and BIOC 302 or 303
- 6) (one of the former PHYS 110, 115, or 120)
or PHYS 100 (Introductory Physics) and 101 (Elementary Physics I)
or PHYS 101 (Elementary Physics I) and 102 (Elementary Physics II)
or PHYS 120 (Physics II) and 122 (Physics II)
- 7) (one of the former BIOL 101, 102, or 103)
or BIOL 110 (Cellular and Organismal Biology) and BIOL 120 (Genetics, Evolution and Ecology)
or BIOL 115 (Organismal Biology) and BIOL 120 (Genetics, Evolution and Ecology)

Students completing the Science One Program should take an additional six credits of English.

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 program 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%, based upon the system of grading used at The University of British Columbia, is required.

Aptitude Testing

Prospective applicants must take the Canadian Dental Association Dental Aptitude Test (or the American Dental Association Aptitude Test). Information and application forms are available from the Student Counselling and Resources Centre, UBC; or the Office of the Dean, Faculty of Dentistry; or Dental Aptitude Test Program, Canadian Dental Association, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6. Inquiries concerning the American Dental Association test should be addressed to the Division of Educational Measurements, Council on Dental Education, American Dental Association, 211 East Chicago Avenue, Chicago, Illinois 60611. At the time of the test the student should request that the scores be sent to Undergraduate Admissions, Office of the Dean, Faculty of Dentistry, 350-2194 Health Sciences Mall, The University of British Columbia, Vancouver, B.C. V6T 1Z3.

Deposit

The successful applicant is required to submit a deposit of \$100 within two weeks of notification of acceptance by the University. This deposit is non-refundable and will be applied towards the tuition of the first term of the session for which the student has been accepted.

Admission of Students to Advanced Standing

- 1) a) The Committee will consider applicants who are seeking admission into second year Dentistry and who are currently enrolled in a North American dental program accredited by either the Canadian Dental Association or the American Dental Association. Applicants will be considered for transfer in exceptional circumstances only. Applicants will be considered only if space is available. In these cases, the student:

- i) must fulfil the pre-dental admission requirements of this University;
- ii) must have successfully completed courses equivalent to those offered in this Faculty for

the years below that into which transfer is being sought:

- iii) may be required to pass special placement or other examinations set by this Faculty;
 - iv) may be required to repeat the year most recently completed at the former institution;
 - v) must submit a \$50 application fee for B.C. documents or a \$75 application fee for out-of-province documents to cover the costs of evaluating educational documents;
 - vi) must submit references (forms for this purpose are included in the application materials);
 - vii) may be required to attend for a personal interview at the candidate's expense.
 - viii) must make application by December 15 for the following September.
- b) Students who have been required to withdraw from any other dental school for academic or other reasons are not eligible for admission.
- 2) Students who have obtained their dental degree from a foreign country and wish to obtain a Canadian degree in order to practise in Canada
- Foreign dentists may seek admission to the second year of the dental program. Applicants are occasionally considered subject to space being available. In these cases, the applicant:
- a) must submit a complete record of their entire education from high school or pre-university study to the end of university studies. Evidence of graduation must be submitted as well as official transcripts of the applicant's marks for this period.
 - b) must possess a good working knowledge of the English language.
 - c) will be required to present results from either of the following examinations:
 - i) National Dental Examining Board of Canada comprehensive examination (written section). Candidates will be required to attain "pass" standing on this examination. Information and application materials may be obtained from the National Dental Examining Board of Canada, 203 - 100 Bronson Avenue, Ottawa, Ontario K1R 6G8, or
 - ii) Part I of the U.S. National Dental Board examinations. Candidates will be required to attain a score of at least 85 on this examination. Details of the examination and an application will be mailed to the applicant following submission of application to this dental school.
 - d) must submit a \$75 application fee to cover the costs of evaluation of educational documents.
 - e) must make application by December 15 for the following September.
 - f) must submit references (forms for this purpose are included in the application materials).
 - g) will be required to complete the Dental Aptitude Test (see Aptitude Testing above).
 - h) may be required to attend for a personal interview at the candidate's expense.

Compliance with the above rules will not guarantee a place in this dental school. An applicant with advanced placement can only be admitted if a place is vacated by an existing student. We receive many more applications than we can accept.

Beyond the first four weeks of first term in any academic year, no vacancies caused by student withdrawal in any class will be filled, except in extraordinary circumstances.

Registration and Orientation

Registration is carried out through TELEREG, the University's telephone registration system. Candidates who have been accepted for admission to the Faculty of Dentistry will be notified by mail concerning registration and orientation. Classes begin August 23, 1995. No student will be allowed to register after the first day of instruction in the term, or be admitted to any class after its first meeting, except by permission of the Dean.

A successful applicant may be required to submit a health record to the University Health Service at the time of acceptance. The approved form will be included in the acceptance package. A certificate from a licensed dentist attesting to the applicant's condition of oral health is also requested.

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 physician's certificate 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, arrangement for readmission must be made through the Dean's office.
- 4) A student planning to be absent from classes for any reason must obtain prior permission from the Dean's Office.

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 students find that they will be unavoidably absent from a sessional examination, they, or someone familiar with the 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. Non-observance of this rule may result in 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) Students may be denied the privilege of writing a sessional examination in any subject because of unsatisfactory work or attendance, and in this case they will be considered to have failed in the course.
- 5) In any course which involves both laboratory work and/or clinical and written examinations, a student is required to make satisfactory standing in each part. If

the course is repeated, no exemption will ordinarily be granted from the work in any 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%. (See Index under "Grading Practices".)
- 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(s) failed provided an average of at least 60% in the work of the year, including the failed courses, has been attained. 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. A student who satisfies the requirements of the departments concerned and passes each supplemental examination with a mark of at least 65% 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 in any year taking a full program of studies who does not pass in at least 60% of it will be required to withdraw from the University for at least a year.
- 6) Although satisfactory academic performance is prerequisite to advancement, it is not the sole criterion in 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 considered to be unsuited to proceed with the study or enter the practice of dentistry.

Instruments and Supplies

Information regarding textbooks will be given by the instructor in each course. Not less than \$800 per year should be available for purchasing textbooks and expendable supplies.

The following instruments and supplies will be required during the four years of instruction. It is recommended that no purchases be made until details are furnished by the departments concerned. Amounts quoted are subject to change without notice.

	Approximate Price
Cardiopulmonary Resuscitation Certificate course	\$ 20.00
Instruments for anatomy and physiology	\$ 15.00
Laboratory coats or clinical attire (incl. laundry)	\$ 400.00
Microscope — an approved model (first year only)	\$ 1,000.00
Dental Instruments—First Year	\$ 3,100.00
Dental Instruments—Second Year	\$ 4,000.00
Dental Instruments—Third Year	\$ 5,240.00
Dental Instruments—Fourth Year	\$ 1,020.00
Course handouts —maximum/year	\$ 100.00

Graduation

- 1) A candidate for the D.M.D. degree must have fulfilled all the requirements for entrance to the Faculty of Dentistry and have attended the courses of instruction which comprise the dental curriculum. No one will be admitted to candidacy for the D.M.D. degree who has not been in attendance for at least two years at The University of British Columbia, the final year of which must be in the Faculty of Dentistry.
- 2) Each candidate for graduation must have passed all examinations in subjects comprising the dental course or must have received satisfactory standing in courses where specific marks are not assigned.
- 3) The Faculty will recommend to Senate the granting of the D.M.D. degree to a student who has completed satisfactorily the academic requirements and who, in addition, is recommended by the Faculty to be a suitable person to practise Dentistry.
- 4) Every candidate for a D.M.D. degree must make formal application for graduation. Application for graduation must be made not later than February 15. Special forms for this purpose are provided by the Registrar's Office.

Regulations Regarding Licence to Practise Dentistry

The possession of a D.M.D. degree does not automatically confer the right to practise dentistry in any province in Canada. Each province has a licensing body which grants a licence to practise dentistry within its own borders. Inquiries concerning registration and licensing should be directed to the Registrar, College of Dental Surgeons of B.C., 1765 West 8th Avenue, Vancouver, B.C., V6J 5C6 or to their counterparts in other provinces. Most provinces will accept for registration the certificate issued by the National Dental Examining Board of Canada, the fee for which is \$490 (subject to change). Information concerning National Dental Examining Board certificates may be obtained from The Secretary Treasurer, National Dental Examining Board of Canada, 203-100 Bronson Street, Ottawa, Ontario, K1R 6G8.

Courses of Instruction

- First Year—ANAT 400, 401; PATH 401; PHYL 400; ORBI 410, 411, 412, 413; MICB 415; CDSC 401 (elective), 410, 411, 414.
- Second Year—ANAT 425; PHYL 425; MICB 425; PHAR 425; ORBI 420, 423; OMSS 421, 422, 423, 425, 426, 427; CDSC 420, 421, 422, 423, 424, 425.
- Third Year—ORBI 430; OMSS 431, 433, 434, 435, 436, 437; CDSC 430, 431, 432, 433, 434, 435.
- Fourth Year—ORBI 440, 448 (elective); OMSS 441, 443, 444, 446, 448; CDSC 440, 441, 442, 443, 444, 445; HCET 400 (elective).

The D.M.D. Degree Combined with the B.Sc. Degree

Students who have completed the third year in one of the approved degree programs of the Faculty of Science at UBC and the first two years in the Faculty of Dentistry at UBC, and who have completed **all** the course requirements of the degree program may be eligible for the appropriate B.Sc. degree. It is necessary that such students meet all the specific course requirements of the departmental degree program and have the approval of the Head of the Department prior to entry into the Faculty of Dentistry. Students should plan to meet these specific

course requirements while in the Faculty of Science. With the approval of the Dean of Science, up to 30 credits of course work in the Faculty of Dentistry may be recognized for credit towards the B.Sc. degree.

Students in the Faculty of Dentistry who wish to qualify for the B.Sc. degree must file a copy of their program in first and second year Dentistry with the Dean of Science by September 15 of the Winter Session of the year preceding the Fall in which they plan to qualify for the B.Sc. Degree.

Bachelor of Dental Science B.D.Sc.

Dental Hygiene Degree Completion Program

The Faculty of Dentistry offers a post-diploma dental hygiene degree completion program that leads to a Bachelor of Dental Science degree (B.D.Sc.). Completion of the degree will require completion of a minimum of 60 credits of course work, including 34 to 38 credits of core material, following graduation from an accredited dental hygiene diploma program. Course work will allow the student to focus studies on community dental health care, advanced clinical practice, or allied dental education.

Third Year

Course	Credits	
CDSC 400	6	Current Issues in Oral Health Sciences
CDSC 402	8	Dental Hygiene Care
MICB 425	3	Oral Microbiology and Immunology
OMSS 435	4	Oral Pathology
	9	Electives
Total	30	

Fourth Year

Course	Credits	
CDSC 404	6	Advanced Dental Hygiene Care
CDSC 461	4	Literature Review in Periodontology I, and/or
CDSC 462	4	Literature Review in Periodontology II
HCEP 400	3	Statistics for Health Research, or
EPSE 482	3	Introduction to Statistics for Research in Education
	13-17	Electives to support options in:
		• Community Dental Health Care
		• Advanced Clinical Practice
		• Allied Dental Education
Total	30	

Admission

The Faculty of Dentistry reserves the right to select students for admission to the program from among those who meet the admission requirements.

- 1) Candidates for admission must have completed 30 credits of university or equivalent courses which must include:
 - Six credits of Biology 110, 115, 120
 - Chemistry 103, 110, or 121 and 122
 - Six credits of first-year English*
 - Psychology 100 or six credits of second-year psychology
 and must have graduated from a dental hygiene program accredited by the Commission on Dental Accreditation of Canada, with a minimum 65% overall average.
- 2) Courses used to satisfy 1) above will not be accepted for credit to the degree completion program.
- 3) Preference will be given to candidates with at least one year of practice experience.

* Satisfactory completion of the Language Proficiency Index (LPI) is prerequisite to all first-year English courses at UBC. (See *Calendar* index under Language Proficiency Index.)

- 4) Selection for admission will be made on the basis of:
 - academic record
 - interview results
 - professional references
- 5) Candidates who meet minimum admission requirements are not guaranteed admission.
- 6) Applicants may be required to demonstrate clinical proficiency.

Degree Completion Requirements

- 1) Minimum passing grade for all courses is 60%.
- 2) Students will be expected to complete the program within five years of registration.
- 3) The degree completion years will require a minimum of 60 credits of required and elective courses.
- 4) Minimum of 30 credits must be completed at UBC.

Application

Application forms and descriptive literature may be obtained from the Secretary, Division of Periodontics, Department of Clinical Dental Sciences, Faculty of Dentistry, 2199 Wesbrook Mall, The University of British Columbia, Vancouver, B.C., Canada, V6T 1Z3. Deadline for application each year is April 15 for admission the following September. There is an application fee of \$50 for applications with B.C. documents and \$75 for applications with out-of-province documents which must accompany completed applications.

Post-Graduate Training Programs

Periodontics

The Department of Clinical Dental Sciences offers post-graduate training in periodontics in conjunction with the M.Sc. (Dental Science) as a three-year program. Successful graduates will receive a Diploma in Periodontics as well as the Master of Science degree in Dental Science (M.Sc. (Dental Science)). The program will provide education and training for potential clinicians, researchers and specialist teachers in periodontology. The Diploma is not offered without successful completion of the Master's Degree.

Admission to the combined program is subject to evidence of a capacity for graduate study and applicants must satisfy the requirements for admission to the Faculty of Graduate Studies. Applicants must hold a D.M.D. degree or its equivalent from a recognized university. Registration in the course is dependent upon the availability of adequate faculty and facilities.

Graduates will be eligible to take the examinations for specialty certification in Periodontics of The Royal College of Dentists of Canada and the American Board of Periodontology.

Application forms and descriptive literature may be obtained from the Secretary, Division of Periodontics, Department of Clinical Dental Sciences, Faculty of Dentistry, 2199 Wesbrook Mall, The University of British Columbia, Vancouver, B.C., Canada, V6T 1Z3. There is an application fee of \$50 which must accompany the completed application. Deadline for applications is October 1 for admission the following September.

Deposit

Students accepting an offer of admission to the combined M.Sc. and Diploma program, or the Diploma program alone, at the time of acceptance of admission are required

to pay a non-refundable deposit of \$500 to be applied towards the student's first-term tuition.

Oral Medicine, Oral Pathology and Oral Radiology

The Department of Oral Medical and Surgical Sciences offers graduate training in each of the above areas in conjunction with an M.Sc. (Dental Science). Normally these are three separate programs. Successful graduates will receive Diplomas in the respective clinical disciplines as well as Master of Science degrees in Dental Sciences (M.Sc. (Dental Science)). The programs will provide education and training for potential clinicians, research workers and teachers in these areas. The Diploma is not offered without successful completion of the Master's degree.

Admission to the programs is subject to evidence of the capacity for graduate study and applicants must satisfy the requirements for admission to the Faculty of Graduate Studies. Applicants must hold a D.M.D. degree or its equivalent from a recognized university. Registration is dependent upon the availability of adequate faculty and facilities.

Consent of the department is required prior to registration.

It is anticipated that graduates will be eligible to sit the examination of the Royal College of Dentists of Canada.

Application forms and descriptive literature may be obtained from the Head, Department of Oral Medical and Surgical Sciences, Faculty of Dentistry, The University of British Columbia, 2199 Wesbrook Mall, Vancouver, B.C. V6T 1Z3, Canada. The completed application must be submitted before October 1 for entry to the program the following year.

Students accepting an offer of admission to the M.Sc. program are required to pay a non-refundable deposit of \$500 at the time of acceptance. This will be applied towards the student's first-term tuition.

Ph.D. in Oral Biology

See Faculty of Graduate Studies.

M.Sc. in Dental Science

See Faculty of Graduate Studies.

General Practice Residency Program

The Departments of Dentistry of the Vancouver Hospital and Health Sciences Centre (12th and Oak site and UBC site), the B.C. Cancer Agency and British Columbia's Children's Hospital, offer a one-year General Practice Residency training program commencing each June and July. The residents selected must be registered as students in the Division of Graduate/Postgraduate Studies of the Faculty of Dentistry and with the College of Dental Surgeons of British Columbia for which separate fees are paid.

Admission

Graduates of any accredited Canadian dental school are eligible for admission. All candidates must satisfy the requirements for registration of the College of Dental Surgeons of B.C. Graduates of foreign dental schools must possess a current and valid certificate from the National Dental Examining Board of Canada.

Application

Application forms and descriptive literature may be obtained from the Head, Division of Hospital Dentistry,

Department of Oral Medical and Surgical Sciences, Faculty of Dentistry, The University of British Columbia, 2199 Wesbrook Mall, Vancouver, B.C., V6T 1Z3, Canada. Enquiries may also be made of the Heads of Dental Departments of the individual teaching hospitals. The completed application must be submitted before November 1 for entry to the program the following year.

Academic Staff

Office of the Dean

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DOROTHY YI NG, B.Sc., D.M.D. (Brit. Col.), Clinical Instructor.
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Division of Orthodontics: V. M. Diewert (Chair), A. A. Lowe, C. B. Wu, E. H. K. Yen.
Division of Pediatric Dentistry: R. L. Harrison (Chair), J. Richman.
Division of Periodontics: H. Lajava (Chair), C. M. Overall, H. G. Scott, J. G. Silver.
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B.D.Sc. Completion Program: B. Craig (Director).
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- Division of Endodontics:** J. Coil (Chair), D. Donaldson.
Division of Hospital Dentistry: G. B. Gibson (Chair), G. Derkson, D. Donaldson, T. Jastak.
Division of Oral Diagnosis and Oral Medicine: B. Blasberg (Chair), D. Sweet.
Division of Oral and Maxillofacial Surgery: T. Jastak (Chair).
Division of Oral Pathology: R. W. Priddy (Chair), L. Zhang.
Division of Oral Radiology: C. Price (Chair), D. McDonnell.
Division of Pain and Anxiety: D. Donaldson (Chair), G. Gibson.
Division of Continuing Dental Education: J. M. Wong, Dip. D.H. (Dal.), B.A. (Brit. Col.), Director.

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Dr. William S. Russell

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Application Information

For details of application deadlines, tuition and student fees, please consult the General Information section of the *Calendar*.

Application forms for admission to Initial and Continuing Teacher Education programs may be obtained from the Teacher Education Office, Faculty of Education, The University of British Columbia, 2125 Main Mall, Vancouver, B.C., V6T 1Z4; telephone (604) 822-5242, fax (604) 822-8227.

All completed application forms must be accompanied by an application fee. Application fees for Teacher Education Programs are \$42.00 (\$10.00 document processing; \$32.00 document evaluation) for applicants presenting B.C. documents and \$52.50 (\$10.00 document processing; \$42.50 document evaluation) for applicants presenting documents from outside B.C.

Application forms for admission to Graduate programs in education may be obtained from the Office of Graduate Programs and Research at the same address, telephone (604) 822-5512, fax (604) 822-8971.

Initial Teacher Education

The initial teacher education program integrates two academic years of pedagogical studies and school experiences. For persons intending to teach in elementary schools, it presumes completion of at least three years of appropriate post-secondary studies during which the prospective teacher becomes broadly educated and acquires specific knowledge and skills in subject fields relevant to the elementary school curriculum. For persons intending to teach in secondary schools, the program builds on the prior completion of a Bachelor's degree combining breadth of liberal education with depth of study in one or two subjects in the secondary school curriculum.

Within the program, students extend their liberal education by exploring educational theory and practice, applying their understanding in carefully graduated teaching practice and building a foundation for leadership in classroom and community. The program enhances students' abilities to reason well, to communicate effectively, and to share their subject-matter achievements and enthusiasm.

Following completion of all program requirements, students are recommended to the University Senate for the Bachelor of Education degree. They normally qualify for the British Columbia Professional Teaching Certificate. (See also "Licensing Agencies and Professional Associations".)

Admission

Secondary School graduates planning a teaching career will seek initial admission to a degree program in an appropriate field other than Education. After completing the general education requirements and teaching fields courses specified below, they will apply for admission to a program of initial teacher education in the Faculty of Education.

Elementary Teaching Programs

While it is recommended that applicants have a Bachelor's degree, applicants are eligible for admission to the two-year program with a minimum of 90 UBC-equivalent credits acceptable to the Faculty of Education, normally in subject fields within arts, fine arts, science, music, and human kinetics (physical education).

Applicants to the 12-month program must have completed a four-year degree (120 UBC-equivalent credits), including a minimum of 90 credits in arts, fine arts,

The Faculty of Education

- Initial Teacher Education
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science, music, and human kinetics (physical education). The remaining credits may be in any recognized fields of study, except that they may not include course content prescribed for the teacher education program. Only courses acceptable for inclusion in the 90-credit minimum requirement will be used in calculating an applicant's admission average.

Pre-admission studies for applicants to both programs must include

- 1) six credits of English literature and composition or equivalent.
- 2) At least three (preferably six) credits in a laboratory science, in mathematics (not statistics), and in social studies (history or geography). Laboratory science courses are normally selected from the life sciences, chemistry, physical geography, geology, astronomy, or physics.
- 3) three credits of Canadian Studies.
- 4) 18 credits at the senior level (normally courses numbered 300 or higher) in one subject area included in the B.C. elementary school curriculum (art, drama, language arts [English and French], mathematics, music, physical education, science, and social studies).
- 5) An overall average of 65% on the best 60 credits (including the 18 senior credits).

In addition, applicants to both programs must have volunteer or other experience in working with young people, preferably at the age range they are proposing to teach.

Secondary Teaching Program

Applicants must have completed a four-year Bachelor's degree (or equivalent), normally in subject fields within arts, fine arts, science, commerce or business administration, music, and human kinetics (physical education), or in other secondary teaching fields.

Prospective teachers of technology education should consult "Technology Education Programs" for admission and program requirements.

Pre-admission studies must include

- 1) six credits of English literature and composition or equivalent.
- 2) Either:
 - a) one teaching major and one teaching concentration,
 - b) two teaching concentrations, or
 - c) one teaching major.

At least one teaching field must be a subject widely taught in B.C. secondary schools.

Applicants should consult "Secondary Teaching Field Requirements" for information concerning the junior and senior courses for acceptable secondary teaching majors and concentrations and for a list of subjects widely taught in B.C. secondary schools.

- 3) An average of 65% on the senior courses, normally numbered 300 and above, required for each teaching field.

In addition, applicants to this program must have volunteer or other experience in working with young people, preferably at the age range they are proposing to teach.

Advice to Prospective Applicants

- 1) To increase the breadth of their experience and improve their opportunities for employment, applicants for the secondary teaching program are strongly advised to have completed subject-matter preparation for at least two teaching fields.
- 2) Applicants to elementary programs require, beginning in 1994, three credits, and beginning in 1996, six credits of Canadian Studies. (The Canadian Studies entry in the Faculty of Arts section of this *Calendar* provides examples of such courses.)
- 3) It is important for students anticipating admission to the elementary teaching program prior to completion of a Bachelor's degree (see above) meet all requirements needed to facilitate degree completion at a later date. Graduates of the elementary teaching program wishing to complete their Bachelor's degree will be subject to regulations and program requirements of the institution offering the degree. Attendance on a full-time basis may be necessary.

Note: Changes contemplated by the Government of British Columbia may require that all applicants to initial teacher education programs have a recent criminal record check.

Selection Process

Admission decisions are made by the Admissions Committee of the Faculty of Education, which reflects in its composition both the academic and professional aspects of teacher education. Applicants must submit for consideration by the Committee, on the form provided, the following:

- 1) a statement of relevant experience working with children or youth (please note that applicants without such experience will not be admitted);
- 2) a personal statement indicating what they have learned from their experience working with children or youth that will help them in their teaching careers; and
- 3) two confidential statements from referees qualified to attest to the applicant's suitability for teaching.

An interview may be required by the Faculty as a part of the admissions process. Applicants are responsible for their own expenses in attending admissions interviews.

Abbreviations Used in this Section

ARTE	Art Education
EDCI	Curriculum and Instructional Studies
EDST	Educational Studies
EDUC	Education

ENED	English Education
EPSE	Educational Psychology and Special Education
MAED	Mathematics Education
MUED	Music Education
READ	Reading Education
SCED	Science Education
SSED	Social Studies Education
TSED	Technology Studies Education

The Elementary Teaching Programs

The elementary teaching programs allow candidates to focus their preparation on either Primary or Intermediate school teaching.

Specific program options include

- 1) The 12-month program which extends over three consecutive university terms (September to August) and which is open to graduates holding acceptable four-year degrees (120 credits).
- 2) The two-year program which extends over two regular winter sessions (September to April) and which is open to applicants who have completed a minimum of three years (90 credits) of appropriate post-secondary studies.
- 3) *Le programme en langue française* which operates on the 12-month pattern and which is open to graduates holding acceptable four-year degrees (120 credits) and having satisfactory competence in oral and written French, and
- 4) The Native Indian Teacher Education Program which is a five-year concurrent program of liberal and pedagogical studies and which is open to persons of First Nations ancestry who qualify for university admission at the first year level.

After completing all program requirements, candidates are awarded the Bachelor of Education (Elementary) degree and are normally eligible for the British Columbia Professional Teaching Certificate. (See "Native Indian Teacher Education Program".)

The 12-month program

Term 1 (September to December)

Prospective teachers are introduced to the theoretical bases of modern educational practice and to strategies and methods of teaching, both in general and in relation to the subjects they are preparing to teach. Studies include analysis of the nature and objectives of education and of the developmental characteristics of learners. The term includes a communications course in which attention is given to the student's own interpersonal and communication skills in relation to the demands of the elementary school. Structured classroom observations and teaching experiences (such as tutoring, peer teaching, and microteaching) are provided.

Course Credits

ARTE	320	2	Curriculum and Instruction: Art
EDST	314	3	The Analysis of Education
EDUC	310	1	Principles of Teaching: Elementary
EDUC	315	0	Pre-Practicum Experience
EDUC	316	3	Communication Skills in Teaching
EPSE	313	3	Educational Application of Developmental Theories
MUED	320	2	Curriculum and Instruction: Music
READ	310	3	Introduction to Elementary Reading and Language Arts Instruction

Term 2 (January to June)

This term begins with an intensive two-week school placement in a selected B. C. elementary school in which

students consolidate their understanding of the first term principles and approaches, and in which the student will undertake an extended practicum later in the term. Following the two-week school placement, the student continues with curriculum and instruction courses in other subjects offered as part of the elementary curriculum. The remainder of the term is spent in a 13 week extended practicum in a selected B.C. elementary school where the student works with experienced teachers who have been specially prepared for this supervisory and instructional responsibility. Faculty support, advice, and assessment are provided on a regular basis.

Course Credits

EDUC	320	2	Curriculum and Instruction: Physical Education
EDUC	321	0	Orientation School Experience: Elementary
EDUC	318	18	Extended Practicum: Elementary
ENED	320	2	Curriculum and Instruction: Language Arts
MAED	320	2	Curriculum and Instruction: Mathematics
READ	320	2	Curriculum and Instruction: Reading
SCED	320	2	Curriculum and Instruction: Science
SSED	320	2	Curriculum and Instruction: Social Studies

Term 3 (July to August)

Following completion of the extended practicum, students return to the campus for studies designed to put their teaching competence in a more comprehensive framework of knowledge and understanding. Students attend during July and August to complete final degree and certification requirements.

Course Credits

EDUC	320	2	School Organization in its Social Context
EPSE	317	3	Development and Exceptionality in the Regular Classroom
EPSE	323	3	Learning, Measurement, and Teaching

One of:

EDST	425	3	Educational Anthropology
EDST	426	3	History of Education
EDST	427	3	Philosophy of Education
EDST	428	3	The Social Foundations of Education
EDST	429	3	Educational Sociology

Total 61

Le programme en français

Ce programme forme des enseignants au niveau élémentaire en immersion française, au programme cadre de français, et en français langue seconde.

Les conditions et le processus d'admission sont en principe les mêmes que pour tout étudiant inscrit au programme de formation élémentaire en anglais. De plus, le candidat à ce programme aura complété un cours de langue et un cours de littérature de deuxième année et aura réussi l'examen de français parlé et écrit avant d'être admis.

Le programme français comporte des cours parallèles au programme anglais. Plusieurs cours de base sont assortis de sections réservées au programme français. Les éléments facultatifs du programme français sont offerts en partie par le département de didactique des langues. La formation se complète par des stages prolongés dans des classes où les langues d'enseignement sont le français et l'anglais.

The 2-year program

Year 1 - Term 1

Prospective teachers are introduced to the theoretical bases of modern educational practice. Studies include analysis of the nature and objectives of education and of the developmental characteristics of learners. Attention is given to students' own interpersonal and communication skills and to strategies and methods of teaching. Structured classroom observations and teaching experiences

(such as tutoring, peer teaching, and microteaching) are provided.

Course Credits

EDST	314	3	The Analysis of Education
EDUC	310	1	Principles of Teaching: Elementary
EDUC	315	0	Pre-Practicum Experience
EDUC	316	3	Communication Skills in Teaching
EPSE	313	3	Educational Application of Developmental Theories
EPSE	317	3	Development and Exceptionality in the Regular Classroom
READ	310	3	Introduction to Reading and Language Arts Instruction

Year 1 - Term 2

This term includes an intensive two-week school placement in a selected B.C. elementary school in which students consolidate their understanding of the first term principles and approaches, and to which they return for the extended practicum. This classroom experience provides a basis for further studies of ways of organizing knowledge for instruction and of methods and strategies for teaching. Elementary students will prepare to teach all subjects at specific grade levels.

Course Credits

ARTE	320	2	Curriculum and Instruction: Art
EDUC	320	2	Curriculum and Instruction: Physical Education
EDUC	321	0	Orientation School Experience: Elementary
ENED	320	2	Curriculum and Instruction: Language Arts
MAED	320	2	Curriculum and Instruction: Mathematics
MUED	320	2	Curriculum and Instruction: Music
READ	320	2	Curriculum and Instruction: Reading
SCED	320	2	Curriculum and Instruction: Science
SSED	320	2	Curriculum and Instruction: Social Studies

Year 2 - Term 1

Students spend this term in selected B.C. elementary schools. Each student works closely with a team of experienced teachers who have been specially prepared for this supervisory and instructional responsibility. Faculty support, advice, and assessment are provided on a regular basis.

Course Credits

EDUC	318	18	Extended Practicum: Elementary
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Year 2 - Term 2

Following completion of the extended practicum, students undertake professional studies to put their teaching competence in a more comprehensive framework of knowledge and understanding. The term includes elective or prescribed studies appropriate to each student's personal academic and professional interests.

Course Credits

EDUC	320	2	School Organization in its Social Context
EPSE	323	3	Learning, Measurement, and Teaching

One of:

EDST	425	3	Educational Anthropology
EDST	426	3	History of Education
EDST	427	3	Philosophy of Education
EDST	428	3	The Social Foundations of Education
EDST	429	3	Educational Sociology
Phis	9-12	12	credits of academic, curriculum, and professional electives. (Students who wish to complete a teaching concentration in an elementary school field should select 12 credits related to their pre-admission subject specialization. Details of concentration areas and requirements are available from the Teacher Education Office.)

Total 70 - 73

The Native Indian Teacher Education Program (NITEP)

This program is for persons of First Nations ancestry. It is designed to incorporate First Nations personal and cul-

tural resources and knowledge in preparation for teaching positions in B.C. elementary schools.

NITEP includes similar requirements for both liberal education and pedagogical preparation to those set for all students for elementary teaching. The course sequence, however, is different. Applicants who qualify for university admission complete two years of studies at one of the NITEP field centres where the program consists of Arts and Science courses, pedagogical courses, and structured education placements. To satisfy remaining degree requirements, students attend at the UBC campus.

NITEP students qualify for the Bachelor of Education (Elementary) degree and the British Columbia Professional Teaching Certificate after completing all prescribed courses and practica. Students may qualify for a British Columbia Standard Teaching Certificate after completing a minimum of 128 credits (all practica and all courses set for Years 1 to 4 except those marked *).

To qualify for the degree, a student must normally complete all requirements within 10 years of initial registration in the program. Although the total program may be completed in five academic years as indicated below, many students find it convenient to take some courses during summer sessions; up to 12 credits may normally be completed during a summer session.

Years 1 and 2

Course	Credits	Description
EDST 311	3	The Analysis of Education
EDUC 140	3	Introduction to Native Indian Studies
EDUC 141	3	Cultural Studies
EDUC 143	0	Seminar and School Observation
EDUC 240	3	Issues in Native Indian Education
EDUC 244	0	Seminar and Classroom Observation
EDUC 316	3	Communication Skills in Teaching
EPSE 313	3	Educational Application of Developmental Theories
Plus	6	credits of first year English
Plus	36	credits of elective courses from the Faculties of Arts or Science or the School of Physical Education. Students should complete the mathematics, laboratory science, and social studies requirements within these credits. SCED 190 may be taken as the laboratory science course. A course in English composition or writing is recommended.

Year 3

Course	Credits	Description
EDCI 396	3	Curriculum Development and Evaluation
EDUC 345	0	Native Curriculum Field Experience
Plus	18	credits of Arts or Science elective courses (including courses in a laboratory science, mathematics, and social studies [history or geography] if not completed previously)
Plus	12	credits of Arts or Science elective courses* (Senior courses in one subject field included in the B.C. elementary school curriculum)

Note: In order to be promoted to Year 4, students must have completed at least 75 credits (including six credits of first year English and other required courses) and have achieved an average of 65% on their best 60 credits.

Year 4 – Term 1

Course	Credits	Description
EDUC 310	1	Principles of Teaching: Elementary
EDUC 315	0	Pre-Practicum Experience
EDUC 441	3	Interdisciplinary Studies in First Nations Education
READ 510	3	Introduction to Reading and Language Arts Instruction
EPSE 317	3	Development and Exceptionality in the Regular Classroom
Plus	3	credits of Arts or Science elective*

Year 4 – Term 2

Course	Credits	Description
ARTE 320	2	Curriculum and Instruction: Art
EDUC 320	2	Curriculum and Instruction: Physical Education
EDUC 321	0	Orientation School Experience: Elementary
ENED 320	2	Curriculum and Instruction: Language Arts
MAED 320	2	Curriculum and Instruction: Mathematics
MUED 320	2	Curriculum and Instruction: Music
READ 320	2	Curriculum and Instruction: Reading
SCED 320	2	Curriculum and Instruction: Science
SSED 320	2	Curriculum and Instruction: Social Studies

Year 5 – Term 1

Course	Credits	Description
EDUC 418	18	Extended Practicum: Elementary

Year 5 – Term 2

Course	Credits	Description
EDUC 420	2	School Organization in its Social Context
EDUC 426	3	Pedagogy of First Nations Education
EPSE 423	3	Learning, Measurement, and Teaching
One of:		
EDST 425	3	Educational Anthropology
EDST 426	3	History of Education
EDST 427	3	Philosophy of Education
EDST 428	3	The Social Foundations of Education
EDST 429	3	Educational Sociology
Plus	6	credits of Arts or Science elective courses (Senior courses in the same subject field as the senior courses taken in Year 3)

Total 160

The Secondary Teaching Program

The secondary teaching program prepares students to teach one or two subjects, depending on their prior background, in B.C. secondary schools.

The total program includes the equivalent of two full academic years of courses and student teaching. The program is scheduled within a 12-month period (September to August), thus enabling students to qualify for a teaching certificate within one calendar year.

After completing all program requirements, students are awarded the Bachelor of Education (Secondary) degree and are normally eligible for a British Columbia Professional Teaching Certificate. (See also "Technology Education Programs".)

The Basic Program

Term 1 (September to December)

Prospective teachers are introduced to the theoretical bases of modern educational practice and to strategies and methods of teaching, both in general and in relation to the subject(s) they are preparing to teach. Studies include analysis of the nature and objectives of education and of the developmental characteristics of adolescent learners. This term also includes a communications course in which attention is given to the student's own interpersonal and communication skills in relation to the demands of the secondary classroom. Structured classroom observations and teaching experiences (such as tutoring, peer teaching, and microteaching) are provided.

Course	Credits	Description
EDST 314	3	The Analysis of Education
EDUC 311	1	Principles of Teaching: Secondary
EDUC 316	3	Communication Skills in Teaching
EDUC 319	0	Orientation School Experience: Secondary
EPSE 306	2	Education During the Adolescent Years
EPSE 317	3	Development and Exceptionality in the Regular Classroom
Plus	1	Curriculum and Instruction Courses
	1	credits related to first teaching subject
	2 - 1	credits related to second teaching subject

(Students preparing to teach only one subject will instead take 2 - 1 credits of additional courses related to that subject.)

Term 2 (January to April)

This term begins with large group sessions intended to address current and controversial issues as students prepare for the extended practicum. The remainder of the term is spent in a selected B.C. secondary school where the student works with a team of experienced teachers who have been specially prepared for this supervisory and instructional responsibility. Faculty support, advice, and assessment are provided on a regular basis.

Course	Credits	Description
EDUC 315	0	Pre-Practicum Experience
EDUC 329	18	Extended Practicum: Secondary

Term 3 (May to August)

Following completion of the extended practicum, students return to the campus for studies designed to put their teaching competence in a more comprehensive framework of knowledge and understanding. An opportunity is provided for them to enhance their subject-matter and/or pedagogical competence.

Course	Credits	Description
EDUC 420	2	School Organization in its Social Context
EPSE 423	3	Learning, Measurement, and Teaching
ENED 426	4	Language Across the Curriculum: Secondary
One of:		
EDST 425	3	Educational Anthropology
EDST 426	3	History of Education
EDST 427	3	Philosophy of Education
EDST 428	3	The Social Foundations of Education
EDST 429	3	Educational Sociology
Plus	9	credits of prescribed courses related to teaching subject(s). Electives if no courses prescribed.

Total 60-62

Le programme en français

Ce programme forme à l'enseignement d'une ou deux matières à l'école secondaire en français langue seconde, en immersion française, et au programme cadre de français.

Les conditions et le processus d'admission sont en principe les mêmes que pour ceux qui se présentent au programme de formation secondaire. De plus, le candidat au programme aura complété un cours de langue et un cours de littérature de deuxième année et aura réussi à l'examen de français parlé et écrit avant d'être admis.

Les postulants pourront choisir le français comme matière d'enseignement; ou le français et une autre langue (incluant l'anglais); ou le français et une matière autre qu'une langue; ou une ou deux matières autre que les langues.

The Technology Education Programs

The Faculty of Education, in cooperation with the British Columbia Institute of Technology, offers programs to prepare secondary school technology education teachers. The full post-secondary preparation for teachers of technology education consists of the equivalent of five academic years (159 to 161 credits) of liberal, technical, and pedagogical courses and school experiences.

The liberal studies component includes six credits of English and 24 credits of electives from the Faculties of Arts and Science. The technical component includes the 60 credits of courses detailed in the Technology Education Major section of "Secondary Teaching Field Requirements". The pedagogical component for technology education students includes the same 60 to 62 credit basic Secondary Teaching Program prescribed for students in other teaching subjects and described in the Basic Pro-

gram section of "Secondary Teaching Programs". In addition to all of these core requirements, technology education students complete an additional nine credits of elective courses (liberal, technical, or pedagogical) in order to qualify for the Bachelor of Education (Secondary) degree.

Prospective technology education teachers with little or no related occupational experience follow the General Program. Before admission to the UBC program of teacher education, they complete all liberal and technical core requirements and normally hold the BCIT Diploma in Industrial Education.

Applicants with approved occupational competence and experience may qualify for an Accelerated Program. They may seek admission to the UBC program of initial teacher education after completing six credits of English and 42 credits of recognized technical studies; they normally hold the BCIT Certificate in Industrial Education. Such students must complete the remaining 24 credits of liberal studies, 18 credits of advanced technical requirements, and nine credits of electives before the award of the B.Ed. degree.

Technology education students normally qualify for the British Columbia Standard Teaching Certificate on completion of a total of 120 credits including the specified admission requirements and all requirements of Terms 1 to 3 of Secondary Teaching Programs. Upon qualifying for the B.Ed. (Secondary) degree they are recommended to the B.C. College of Teachers for the British Columbia Professional Teaching Certificate.

Liberal studies courses may be completed while registered in another faculty or university or at a regional college in B.C. or elsewhere. Technical studies are normally completed at the British Columbia Institute of Technology. Those who wish to prepare as technology education teachers after completing a first degree in another field normally satisfy the liberal studies requirements during their undergraduate programs; if their first degrees satisfy the requirements for a teaching concentration or major in a subject other than technology education, these students may prepare to teach both technology education and that second subject.

Academic Regulations

Material in this section is supplementary to that given in the General Information section of the *Calendar*, and applies specifically to students enrolled in the Faculty of Education.

Written English Requirement

All students admitted to a program leading to teacher certification must provide evidence of a satisfactory standard of written English before beginning their extended practicum. Those who have had all their post-secondary study at an English-language institution(s) are presumed to have achieved a satisfactory standard of writing in the English courses required for admission. All other students will be required to provide evidence of satisfactory achievement by means of an acceptable English language test.

Students who do not provide evidence of an acceptable standard of English during the program may be required to sit a test of written English. On the basis of the results of this test, students may be required by the faculty:

- 1) To improve their standard of written English before proceeding to the extended practicum and/or before

being recommended for the B.Ed. degree and a teaching certificate, or

- 2) to withdraw from the Faculty.

Oral English Requirement

All students admitted to the Initial Teacher Education program must pass the Test of Competence in Oral English. The Test is administered by the Faculty during September. Students who do not pass the test will be required to undergo an evaluation of their spoken English by the Faculty of Education. The results of both the Test and any subsequent evaluation will be used to determine whether they will be required:

- 1) to undertake a program of remedial work in spoken English and/or to obtain further language counseling, or
- 2) to withdraw from the Faculty.

Students will not be permitted to begin the Extended Practicum (Education 418 or Education 329) until they have passed this test.

Advancement

A student must normally have passed all courses prescribed to precede the Extended Practicum before advancing to this part of the program.

Similarly, a student must have completed the Extended Practicum before taking any courses prescribed to follow it.

A student whose academic standing is unsatisfactory may be required either to withdraw from the Faculty or to repeat some courses.

Teaching Practica

Practicum placements are in Lower Mainland School districts and in selected locations throughout the province.

The availability of placements in some areas may be limited and students must be prepared to accept placement for the two- and thirteen-week practica anywhere within 125 km of the UBC campus. Students make their own arrangements for and bear the cost of personal transportation and accommodation during practica.

All teaching practica will be graded on a Pass/Fail basis. (See also below regarding supplemental Practica and Withdrawal from Practica.)

Supplemental Examinations

In any session a student may be granted the privilege of writing supplemental examinations in not more than six credits of courses provided that the student:

- 1) wrote the scheduled final examination and achieved an overall grade of at least 40% in the course in question, and
- 2) achieved credit in at least 60% of a course load of over 12 credits or in at least 50% of a course load of 12 or fewer credits.

The Promotions Committee, at its discretion, may grant supplemental privileges in a further six credits to a student whose course load during a regular winter session is in excess of 30 credits.

The Committee may also prescribe a supplemental Practicum, not to exceed six weeks, for students who at the conclusion of the Extended Practicum have made significant progress but who have not attained the required standard of teaching performance.

For the 12-month teaching programs, supplemental examinations for Term 1 courses will be scheduled during the first week of Term 2.

Termination, Withdrawal, and Readmission

Students who begin the Extended Practicum (Education 329, 418, 495, or 496) are not permitted to drop this course from their records. When, in the judgment of the Faculty of Education and the schools hosting their practica, students do not make satisfactory progress, their practica may be terminated. Those whose practica are terminated or who do not complete their practica satisfactorily, and who qualify for neither a supplemental practicum (see "Supplemental Examinations" above) nor a deferred practicum (see "Deferred Examinations" in the General Information section) will be assigned a failing grade and will be required to discontinue or to withdraw from the program.

After one year, students required to discontinue may appeal to the Faculty for permission to re-enrol. Their appeal must include evidence of their having satisfied any conditions set at the time they were required to discontinue.

Those required to withdraw are not normally readmitted to a teacher education program. In exceptional circumstances a student may, after at least one year, submit a formal appeal for permission to re-enrol. Such an appeal will be granted only after review by the Dean and approval by the Senate Admissions Committee.

Students who withdraw from the program voluntarily will not be entitled automatically to return; each request for reinstatement will be considered by the Faculty Admissions Committee along with other applications at the time.

Students who for any reason fail to complete all requirements of the program within a four year period will not be allowed readmission; they may, however, submit new applications for admission and, if admitted, will receive no advance credit for courses completed previously.

Part-time Students

Because of the tightly integrated character of the program students are normally expected to pursue studies on a full-time basis until all requirements are satisfied.

A limited number of students may be admitted to undertake Year 1 of the two-year elementary teaching program on a part-time basis over two academic years. The Extended Practicum (Year 2 – Term 1) must then be completed on a full-time basis. A student who has completed three terms of the two-year elementary teaching program or two terms of the 12-month teaching programs may seek the Appeals Committee's permission to complete the balance of the program on a part-time basis. Such a request will be granted only if an acceptable plan for program completion is presented; completion must be within four years of initial registration.

Advance Credit

Except as provided in "Programs for Students Upgrading Teaching Qualifications", credit may not normally be transferred from other institutions for courses prescribed for the first three terms of the two-year elementary teaching program or for the first two terms of the 12-month elementary and secondary teaching programs. In special circumstances students may be granted permission to complete some or all of the courses prescribed for the final term at another institution if:

- 1) permission is sought in advance,
- 2) the courses to be transferred are taken after all requirements of preceding terms have been satisfied, and,
- 3) these courses are appropriate to the student's UBC program.

Duplicate Credit

Because courses in the Faculty of Education change significantly over time, certain advanced curriculum and instruction courses and other second-level courses may be re-taken for credit, but only five or more years after they were taken previously and only with the prior permission of the Faculty. Two versions of the same course may not both be used for credit towards the same degree or diploma, though one may be used towards one program (e.g., a B.Ed. or one Diploma specialization) and a more recent version towards another program (e.g., a different Diploma specialization). Basic curriculum and instruction courses and introductory courses without prerequisites may not be repeated.

Students should consult a Program Adviser in the Teacher Education Office to determine whether a specific course may be retaken.

Academic Appeal

An appeal, in general, falls into one of two categories:

- 1) request for review of the standing assigned in a course, or
- 2) protest of a decision relating to academic studies.

For information concerning the procedures for initiating either of these, a student should consult the General Academic Regulations in the General Information section of the *Calendar* under the headings "Review of Assigned Standing" and "Appeal Procedure".

In the Faculty of Education appeals to the Dean related to Initial and Continuing Teacher Education should be addressed in the first instance to the Associate Dean (Teacher Education) for consideration, as warranted, by the Committee on Curriculum, Admissions, Standings, and Appeals.

Prior Programs

- 1) Students who previously qualified for a teaching certificate but who did not complete all degree requirements by 1993 and who wish to qualify for the Bachelor of Education (Elementary) degree may follow the two-year B.Ed. requirements (see the two-year program section in "Elementary Teaching Programs") as follows:
 - a) They must qualify for admission according to the current minimum admission requirements, with appropriate completed courses counted towards such requirements.
 - b) Credit will be granted towards the requirements of the two-year program for appropriate completed courses and practica.
 - c) Those who have not taught within the previous 10 years may require updating courses and practica in addition to the minimum requirements of the program.
- 2) NITEP students who have not completed the previous four-year program may transfer to the current five-year NITEP program (see "Native Indian Teacher Education Program") under similar arrangements.
- 3) Students preparing as Technology Education (Industrial Education) teachers who did not complete their five-year B.Ed. (Secondary) by 1993 may transfer to the current program (see "Technology Education Programs") under similar arrangements.

Programs for the Improvement and Recertification of Teaching Qualification

- 1) Individuals who qualified for teaching certificates in B.C. or elsewhere but who do not hold currently valid B.C. certificates should first consult the B.C. College of Teachers for a ruling concerning their eligibility for a B.C. Certificate.
- 2) Persons who have a program of 18 or fewer credits of pedagogical courses plus practicum requirements of nine or fewer weeks duration prescribed as a condition of qualifying for a B.C. Teaching Certificate may be admitted as occasional students (see "Occasional Students"). Normal program and course (including practicum) prerequisites will apply.
- 3) Those without a degree who hold a valid B.C. Teaching Certificate issued on the basis of preparation completed elsewhere (or on the basis of such studies plus the work indicated in point 2), may pursue studies according to the two-year B.Ed. (Elementary) requirements (see point 1 of "Prior Programs"). A maximum of 36 advance credits will be allowed towards the 70 credits required for the two-year B.Ed. (Elementary) degree.
- 4) Those who qualified as teachers outside B.C. but who do not qualify for a B.C. Teaching Certificate as provided in point 2 above, must normally proceed as new applicants to the program of initial teacher education.

Licensing Agencies and Professional Associations

Students preparing to enter the teaching profession should inform themselves concerning teacher certification levels and teacher qualification levels.

Certificate of Qualification (Teacher Certification)

Possession of a certificate of qualification to teach is mandatory for teaching within the public elementary or secondary schools of British Columbia. The Teaching Profession Act has assigned the authority to the British Columbia College of Teachers to issue teaching certificates and to determine the classes of certificates of qualification issued. Persons convicted of, or given an absolute or conditional discharge on, a criminal offence and considering a teaching career, should write the Registrar, College of Teachers for clarification of their status *before* undertaking a teacher education program.

The Faculty reports to the B.C. College of Teachers at the end of each session the names of students who have satisfied requirements for B.C. teacher certification. This report includes a copy of each student's UBC transcript but does not include copies of transcripts from any other institutions. Those not wishing to have their status reported and their transcripts forwarded to the College should inform the Associate Dean (Teacher Education) in writing at least one month before they complete teacher certification requirements.

Current information concerning the membership and certification requirements of the College can be obtained by writing directly to the British Columbia College of Teachers, 405-1385 West 8th Avenue, Vancouver, B.C., V6H 3V9, telephone (604) 731-8170. Information will also be available from the Teacher Education Office, Faculty of Education, Scarfe 103.

Superintendents' Listing

The Faculty reports to each public School District Superintendent the names and addresses of students expected to qualify for initial teacher certification. This report includes program information but does not include birth date; copies of students' permanent records are not forwarded with this report. Those wishing to be excluded from this report should inform the Associate Dean (Teacher Education), Faculty of Education, in writing before January 15.

Qualification Categories

The Teacher Qualification Service (T.Q.S.), sponsored jointly by the B.C. Teachers' Federation and the B.C. School Trustees' Association, is an advisory service to teachers and school boards. The Service acts only on application by a teacher and only after the individual has been granted a British Columbia teaching certificate.

Qualifications are evaluated in categories assigned on the basis of years of professional preparation and programs completed. At present the Service recognizes six categories, each corresponding to the number of years of preparation acceptable to the Teacher Qualification Board. One of the years must be a professional year.

The Faculty reports to the B.C. Teacher Qualification Service at the end of each session the names of students who have satisfied requirements for B.C. teacher certification. This report does not include copies of any transcripts. Those not wishing to have their status reported to T.Q.S. should inform the Associate Dean (Teacher Education) in writing at least one month before they complete teacher certification requirements.

"Request for evaluation" forms are available from the Teacher Education Office, Faculty of Education and from the Teacher Qualification Service office at: 103-1765 West 8th Avenue, Vancouver, B.C., V6J 5C6; telephone (604) 736-5484.

Professional Association

When an individual is granted a Certificate of Qualification under the *Teaching Profession Act*, membership in the B.C. College of Teachers is also granted. Teachers in B.C. public schools are required to maintain membership in the College. The *School Act* also provides for a teachers' association within each school district with responsibility to negotiate on behalf of all teachers in the district an agreement respecting the terms and conditions of employment of all teachers in the district.

The British Columbia Teachers' Federation, 100 - 550 West 6th Avenue, Vancouver, B.C., V5Z 4P2, telephone (604) 871-2283, is the teachers' provincial professional organization to which district associations belong. Publications of the B.C.T.F. are provided to students in teacher education programs on request for a nominal fee; they carry useful articles on teaching practices and on other matters of professional interest. The B.C.T.F. can provide current salary scales for all School districts in the province.

Secondary Teaching Field Requirements

In the following list of secondary teaching fields, "C" indicates that the subject may be presented as a teaching **concentration** and "M" indicates that it may be presented as a teaching **major**. Because certain subjects are not widely taught in B.C. secondary schools, students preparing to teach a subject marked "*" must also prepare to teach at least one not so marked.

Field	Concentration	Major
Agricultural Sciences*	C	
Art	C	M
Biological Sciences	C	M
Business Education	C	M
Chemistry	C	M
Chinese*	C	
Computer Science	C	M
Earth and Space Science	C	M
English	C	M
French	C	M
German*	C	
Home Economics	C	M
Italian*	C	
Japanese*	C	
Mathematics	C	M
Music		M
Physical Education	C	M
Physics	C	M
Russian*	C	
Social Studies (Emphasis on Geography)	C	M
Social Studies (Emphasis on History)	C	M
Social Studies (Emphasis on Social Sciences)*	C	
Spanish*	C	
Technology Education		M
Theatre*	C	

The teaching field requirements for admission to the B.Ed. (Secondary) are listed below. A teaching *concentration* normally consists of 18 credits of senior courses (numbered 300 or higher and taken in years 3 and 4) in addition to specified junior courses (numbered below 300); a teaching *major* normally consists of 30 credits of senior courses in addition to specified junior courses. Students preparing for secondary teaching should have completed all junior and senior requirements for their intended teaching field(s) before seeking admission to the teacher education program.

As indicated below, a number of Schools and Departments of the University have designed undergraduate degree programs for prospective secondary teachers; the detailed requirements of such programs are listed in the appropriate School or Department section of the *Calendar*. Graduates of equivalent programs at other recognized universities are, of course, eligible for consideration.

Art Concentration and Major

- **Concentration:**
An introductory survey course in art history and 12 credits of introductory studio art; 18 credits of third and fourth year art, including at least 12 credits of studio art (which may include art education studio offerings).
- **Major:**
An additional 12 credits of third and fourth year art, 6 of which must be in studio art.

Business Concentration and Major

- **Concentration:**
Introductory courses in computer science, economics, and mathematics as a foundation for 18 credits of specialized courses in accounting, marketing, commercial law, and management information systems. Applicants who do not have keyboarding and data processing skills will be required to acquire these within the teacher education program.
- **Major:**
An additional 12 credits of senior courses in finance, marketing, and management information systems.

Computer Science Concentration and Major

- **Concentration:**
First and second year courses in computer programming, computer structures, and mathematics; 18 credits of senior computing courses covering advanced programming, systems design, programming languages, and the impact of computers on society.
- **Major:**
An additional 12 credits of elective courses in computer science. Applicants with a major in computer science must also prepare in a second teaching subject.

English Concentration and Major

- **Concentration:**
First and second year English; 24 credits of senior English including six credits from each of:
1) English language,
2) English composition or creative writing,
3) pre-twentieth century literature, and
4) twentieth century literature.
Prospective applicants are advised to complete courses in both Shakespeare and Canadian literature.
- **Major:**
An additional 12 credits of senior English.

Home Economics Concentration and Major

- **Concentration:**
12 to 18 credits of introductory courses in home economics and/or family studies; 18 senior credits from the areas of family studies **and** either foods and nutrition or textiles and clothing, or a combination of the latter two areas.
- **Major:**
An additional 12 senior credits in the above.

Mathematics Concentration and Major

- **Concentration:**
12 to 18 credits of junior mathematics and 18 credits of senior mathematics. The program must include courses in three of the following six areas, including at least one of the first three: algebra, geometry, number theory, probability and statistics, applied mathematics and computer science.
- **Major:**
An additional 12 credits of senior mathematics.

Modern Languages Concentration and Major

- **Concentrations:**
First and second year courses in both the language and the literature of the selected language; 18 senior cred-

its in the selected language, at least six of which must be language study and must be completed with second class or higher standing. Applicants who present a language other than French as one teaching field must present a second teaching field which is *not* one of these languages: French and one such language is an acceptable combination as is English and one such language.

- **Major in French:**
An additional 12 credits of senior French.
Note: Students will be required to demonstrate oral and written proficiency in their selected language(s) either prior to admission or early in the program.

Music Major

- **Major:**
B.Mus. with a major in General Studies (Secondary Education Stream).

Physical Education Concentration and Major

- **Concentration:**
Six credits of approved foundational physical education courses from each of: exercise science, motor performance and control, leisure studies, and performance analysis; 18 credits of acceptable senior physical education courses in the areas of instruction and coaching. In addition, applicants must present evidence of knowledge and proficiency in aquatics, dance, gymnastics, and at least four other performance areas included within the secondary school curriculum.
- **Major:**
An additional 12 credits of senior physical education electives. Applicants with a major in physical education must also prepare in a second teaching subject.
Note: Applicants will normally have completed the Instruction and Coaching option within the B.H.K. program.

Science Concentrations and Majors

(Agricultural science, biological sciences, chemistry, earth and space science, and physics).

- **Concentrations:**
Six credits of introductory or survey courses in each of chemistry, mathematics, and physics (an introductory course in each of biology and geology is also required either prior to admission or within the teacher education program); an additional 6 to 12 credits of junior courses and 18 credits of senior courses in the selected science.

The set of courses for each selected science must include both lecture and laboratory studies and satisfy the following:

Agricultural science: Animal science, plant science, and soil science; a half course in agricultural economics is recommended.

Biological sciences: A balanced selection of courses from each of taxa; physiology, cytology, or anatomy; ecology; and genetics.

Chemistry: Organic, inorganic, physical, and analytical chemistry. Biochemistry programs may be suitable.

Earth and space science: A balanced selection of courses from some or all of astronomy, geology, geophysics, oceanography, and/or physical geography.

Physics: Thermodynamics, electricity and magnetism; optics and acoustics; quantum, nuclear, and atomic physics; and mechanics.

- Majors:

An additional 12 credits of senior courses in the selected science. Applicants are admitted as majors in all science fields listed above *except* agricultural science.

Social Studies Concentrations and Majors

(Emphasis on geography, history, and a social science)

- Concentrations:

Six credits of introductory or survey courses in each of geography, history, and a social science; a further six credits of junior courses and 18 credits of senior courses in the discipline of emphasis. The total program must include six credits with a significant Canadian content.

An applicant's program should satisfy the following conditions for the chosen discipline of emphasis:

Geography: Both physical and cultural geography with courses in regional and environmental studies.

History: Canadian, European, and modern world history.

Social Science: An appropriate grouping of courses within a single, acceptable social science discipline (anthropology, Asian area studies, economics, political science, sociology or women's studies).

Note: Applicants may present more than one social studies teaching field. Social science applicants *must* present a second teaching field (either geography, history, or another subject widely taught in B.C. secondary schools).

- Majors:

An additional 12 credits of senior courses in the discipline of emphasis (geography or history only).

Technology Education Major

- Major

60 credits of recognized technical courses, including

- 1) 42 credits of studies covering information technology, power and energy technology, materials and products technology, and systems integration technology, and
- 2) 18 credits of advanced courses in one or two acceptable technical areas.

Note: The University does not itself offer these technical courses but recognizes certain courses offered by the British Columbia Institute of Technology and by other technical institutes where these meet the transfer standards of the University.

Theatre Concentration

- Concentration:

A minimum of 12 credits of junior theatre courses and 18 credits at the senior level. The total program must cover acting, directing, theatrical production, and history of theatre.

Continuing Teacher Education

The Diploma In Education

The Faculty of Education offers a Diploma Program with several fields of specialization within educational theory and practice. The program provides structured sequences of academic and professional studies for teachers and others working in educational or instructional settings. Elementary teachers holding four-year degrees may take the program as a fifth year either to enhance their existing area of professional specialty or to develop a further one.

For teachers who have already completed five years of recognized academic and professional studies, the program provides an opportunity to develop an additional area of professional competence. Most programs, if desired, can be planned to incorporate prerequisites for admission to a Master's program.

A Diploma in Education indicating the field of specialization will be awarded on successful completion of an approved program of study.

Admission

Except for designated specializations, admission to the Diploma in Education normally requires an acceptable bachelor's degree or equivalent. Certain fields of specialization are open only to qualified and experienced teachers, and some have specific course prerequisites. Detailed information is contained in *The Diploma in Education Handbook*, available from the Teacher Education Office, Faculty of Education, or from the relevant departmental offices.

Requirements for the Diploma in Education

The Diploma requires the completion of 30 credits of courses numbered 300 or above with an average of 65% or higher. In most specializations 12 to 18 credits of course work are designated as core requirements, while 12 to 18 credits may be selected from approved supporting or related courses. A maximum of 18 credits of appropriate courses completed at UBC previously and not credited towards the requirements of any other degree, diploma, or teacher certification program may be applied to a diploma program.

In order to qualify for the Diploma in Education, a student must complete all requirements for the selected specialization within five years. Completion of a diploma program does not satisfy any of the requirements for a B.C. teaching certificate.

Residence Requirements and Transfer of Credit

In general there are no residence requirements for the Diploma in Education. In most specialization fields a diploma program may be completed on either a full-time basis over one academic year or on a part-time basis, either on or off-campus. However, in certain designated fields the program may be completed only by full-time study during a regular winter session. A maximum of 12 credits of approved credit may be transferred from other institutions towards the requirements of a Diploma in Education.

Fields of Specialization

Adult Education
Art Education
Business Education
Canadian Studies
Computing Studies Education
Curriculum and Instructional Studies
Educational Psychology
Educational Studies
Education of Children with Developmental Disabilities²
Education of Young Children
English Education
English as a Second Language
French Education
Guidance Studies
Home Economics Education
Infant Development
Language Education

Law-Related Education
Mathematics Education
Mathematics and Science Education
Multicultural and Minority Education
Music Education
Physical Education
Primary Education
Reading Education
Science Education
Social Studies (Elementary)
Special Education
Teacher Librarianship
Technology Studies Education
Values Education
Visual and Performing Arts in Education

¹ Some non-graduates may be admitted in this field. Prerequisite: two years' experience in adult education.

² Full-time study during a regular winter session is required. Completion of a program in this field requires extensive practica. Enrollment is limited; interested applicants should apply early as the selection of students is normally completed by March 1.

Occasional Students

Persons not admitted to a degree or diploma program may be admitted to take elective courses for which they satisfy all stated prerequisites. Interested persons should inquire at the Teacher Education Office concerning courses routinely open to them and courses for which departmental approval is required.

Non-Credit Courses and Programs

Through its Distance Education Office and in conjunction with School Districts, the Faculty of Education makes non-credit as well as credit professional development programs available to practising teachers. Teachers may inquire of their district professional development coordinator concerning programs being planned; information is also available from the Faculty's Distance Education Office.

Graduate Programs in Education

Graduate programs in education are offered by all departments in the Faculty and by the Centre for Curriculum and Instruction. In many cases, students are qualified for more than one program, and should explore the alternatives that are offered. Complete listings can be found under Departments and the Curriculum Centre entries under the Faculty of Graduate Studies. General information on graduate programs in education may be obtained from the Office of Graduate Programs and Research in the Faculty of Education.

Admission to all courses leading to a graduate degree (M.A., M.Ed., Ed.D., Ph.D.) requires registration within the Faculty of Graduate Studies and approval from the relevant Department or Centre within the Faculty of Education. Application forms for graduate programs are available from the various Department or Centre offices within the Faculty of Education. All applications are to be accompanied by complete official transcripts of the applicant's academic record, along with the applicant's professional record to date. If the application is accepted, the applicant will be referred to an adviser within the area offering the program to gain approval for a planned sequence of courses. The student will be under the guidance of an adviser to whom a regular report on

progress must be made. All changes in program must receive approval of the adviser and be reported to the Department or Centre Office.

Applicants for admission to graduate programs are strongly advised to submit their applications before April 1. Deadlines for applications to most programs are May 1 for the following Winter Session and February 1 for the following Summer Session. Applicants should check with the Department or Centre offering the program to confirm their application deadlines. Students admitted before February 1 may be considered for a University Fellowship. The deadline for application for graduate assistantships is May 1.

The following are the departments in the Faculty and the programs they offer:

The Centre for the Study of Curriculum and Instruction offers graduate programs in Curriculum and Instruction and Early Childhood Education.

The Department of Counselling Psychology offers graduate programs in Counselling Psychology.

The Department of Curriculum Studies offers graduate programs in Art Education, Business Education, Home Economics Education, Mathematics Education, Music Education, Science Education, Social Studies Education, and Technology Studies Education.

The Department of Educational Psychology and Special Education offers graduate programs in Educational Psychology; Human Learning, Development and Instruction; Measurement, Evaluation and Research Methodology; School Psychology; and Special Education.

The Department of Educational Studies offers graduate programs in Adult Education, Educational Administration, Higher Education, History of Education, Philosophy of Education, Sociology of Education, and Educational Studies.

The Department of Language Education offers graduate programs in English Language Arts, English as a Second Language, Reading, Teacher Librarianship and Modern Languages.

Where appropriate, joint programs, which involve collaboration among the areas listed above, or which involve an area outside the Faculty of Education can be arranged.

For details of the specific requirements for M.A., M.Ed., Ed.D., Ph.D. degrees, see Faculty of Graduate Studies program details.

Off-Campus Graduate Work

It may be possible for the Faculty of Education to organize graduate programs which have off-campus components offered at locations throughout B.C.

For further information, contact the Department within the Faculty of Education offering the program.

Note: Not all graduate programs are offered in a given year.

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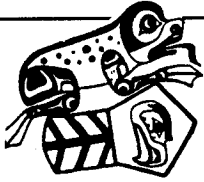
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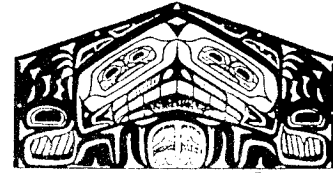
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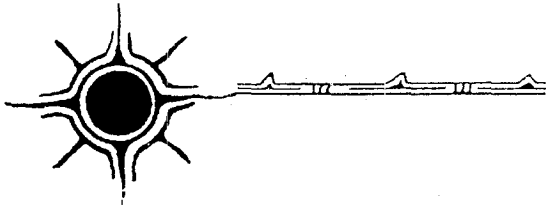
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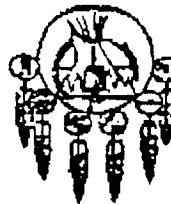
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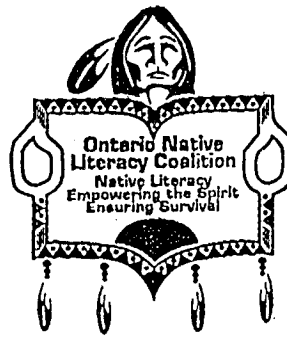
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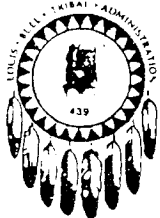
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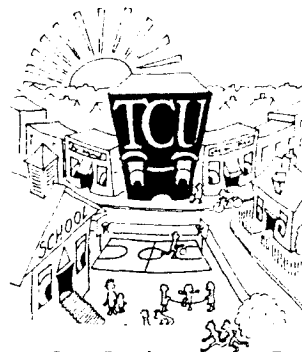
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The Dietetics program and the Major program in Human Nutrition specialize in the physical and biological sciences. They differ in that the Human Nutrition program provides a basic education in life science whereas the Dietetics program involves greater attention to patient care, administration, and the role of diet in the prevention, etiology and treatment of disease.

The Family Science Major program examines the North American family (and its alternatives) in a multidisciplinary, life-span perspective. Courses focus on courtship and marriage, human development in the family context, and family financial or resources management.

Home Economics is an interdisciplinary field of study concerned with improving the quality of domestic life. Study in this area integrates biological, physical and social sciences, and includes course work in family studies, human development, family resource management, foods and nutrition, and clothing, textiles and design, as well as electives from supporting areas. Provision for part-time study in Home Economics may be made by application to the Director of the School.

Professional Opportunities

Graduates of the Dietetics program may apply for a one-year Graduate Dietetic Internship in any province in Canada following graduation, in order to qualify as professional dietitians. Graduates of the Family Science program may pursue advanced degrees or be employed in government or the private sector in positions related to family research or programs. Graduates of the Home Economics program may be employed in a variety of positions in business and industry (especially in the areas of food, clothing and textiles), and in government agencies and extension services. In this program, graduates choosing one of the Specialization Options in family life are often employed by community agencies and institutions which address the educational or human services needs of children and youth, adults, or the elderly. Graduates of the Comprehensive Option of the program may also, with additional training, be employed in teaching. Graduates of the Human Nutrition program most often will pursue advanced degrees leading to positions in university teaching, research, nutrition services, or international food and nutrition organizations.

Dietetic Qualification Study

Graduates holding a Bachelor's degree in Science, Food Science, or Home Economics may undertake additional study in the School of Family and Nutritional Sciences to qualify for application to a Dietetic Internship program (not available in universities). Completion of this study does not lead to a degree in Dietetics and does not guarantee placement in an Internship program. Interested students should consult a Dietetics adviser in the School.

Admission

Only students seeking admission to the Dietetics and Home Economics programs should apply to the University for admission to the School.

Admission to the Dietetics (B.Sc.) and Dietetics Qualifying programs is limited. Students will normally be admitted only to the first or second year of the Dietetics (B.Sc.) program. Students applying to UBC for the first time

The School of Family and Nutritional Sciences

A School within the Faculty of Agricultural Sciences.

The School offers four undergraduate programs:

- the program in Dietetics leads to the Bachelor of Science in Dietetics (B.Sc.(Dietet.)) degree;
- the Major program in Family Science leads to the Bachelor of Arts (B.A.) degree;
- the program in Home Economics leads to the Bachelor of Home Economics (B.H.E.) degree;
- the Major program in Human Nutrition leads to the Bachelor of Science (B.Sc.) degree in Nutritional Sciences.

should follow the standard application procedure. Students currently registered in another program of study at UBC must apply by submitting a Change of Faculty form to the Registrar's Office. The deadline for receipt of applications is April 30. Admission to these programs is based on completion of prerequisites and applicants' previous year or University entrance grade point average calculated according to the procedures developed by the University's Admissions Office. Successful completion of the Science One program fulfills all of the Science and Mathematics requirements for first year, with a Social Science elective and English.

To be considered for admission to the Dietetics Program, students are required to have a minimum academic standing (minimum achievement) of at least 68% (GPA 2.7). Achievement of this minimum academic requirement, however, provides no assurance of admission, as the number of applicants generally exceeds the number of places available.

Students wishing to major in Family Science should apply for admission to the Faculty of Arts and those wishing to major in Human Nutrition in the Nutritional Sciences program should apply for admission to the Faculty of Science. The following information applies, nevertheless, to all students.

British Columbia secondary school graduates will be considered for admission if they have an average grade of C+ (or better) based on the general University Admission requirements set out in the General Information section of the *Calendar*, and the admission requirements of the various programs described below. Applicants will be selected on the basis of their secondary school records and of a general assessment of their capacity for success in university studies as made by the Admissions Committee.

A student who has completed appropriate studies with satisfactory standing beyond Grade 12 may be considered

for admission and the granting of advance credit. Credit on transfer from a B.C. college is restricted to first- and second-year-level university studies.

All new applicants are charged an application fee of \$20 (plus an additional \$50 if out-of-province documents are submitted). This fee must accompany the application for admission form when submitted with supporting documents. The fee is nonrefundable and is not applicable to tuition.

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 and to limit enrolment if its facilities and resources are inadequate.

Academic Regulations

Each program has its own regulations described below. In addition, students should note:

- 1) The minimum number of credits required for all Bachelor's degree programs is 120 credits.
- 2) In their third and fourth years, students in Home Economics (B.H.E.), Dietetics (B.Sc.(Dietet.)) and Family Science (B.A.) must earn at least 48 credits in courses numbered 300 or above; students in Nutritional Sciences (B.Sc.) must complete at least 48 credits in courses numbered 300 or above.
- 3) For students in the Home Economics (B.H.E.) program, a minimum total of 48 credits is required of courses in Family and Nutritional Sciences (FMSC, HMEC, or HUNU).
- 4) In Dietetics and Home Economics, the determination of students' standing as Satisfactory or Unsatisfactory, and of their eligibility to take Supplemental Examinations follows the regulations of the Faculty of Agricultural Sciences.

5) Students who have not completed ENGL 112 by the end of second year will not normally be permitted to enrol in third year or higher-level courses in the Faculty. First-year English courses may require the Language Proficiency Index examination. For additional information on this examination, please refer to the Language Proficiency Index entry in the Index of the *Calendar*.

Family Science Program B.A.

The Family Science Major is an academic program open to students registered in the Faculty of Arts. Students should consult the Faculty of Arts section of the *Calendar* for the general Faculty requirements and regulations pertaining to the Major.

Requirements for the B.A. Degree

Major

First and Second Years

- FMSC 200
- STAT 203

Third and Fourth Years

- FMSC 420
- FMSC 422
- At least 33 additional credits of FMSC courses including:
 - at least one of: FMSC 320, 322, 324, 326, 336
 - at least one of: FMSC 312, 314, 316, 410, 314
 - at least one of: FMSC 338, 340, 342, 440, 442

Bachelor of Home Economics B.H.E.

The program in Home Economics is designed to provide academic preparation for students interested in pursuing a variety of Home Economics related careers. Those intending to pursue secondary school teaching in Home Economics should enrol in the Comprehensive Option. Those who wish to pursue a more specialized program should enrol in either the Family Life Education or Family Consumer Services Specialization Option. Information concerning careers in Home Economics may be obtained on request from the School of Family and Nutritional Sciences.

Admission

Please refer to the Admissions section in the General Information section of the *Calendar*.

Required: Mathematics 12.

Recommended: Biology 11, Chemistry 12 and as many Home Economics courses at the Grades 11 and 12 levels as possible.

Comprehensive Option

First and Second Years

Course	Credits
CHEM 103	6
BIOL 110 or 115	3
BIOL 120	3
ECON 100	6
ENGL 112	3
One of ENGL 110, 111, 120 or 121	3
HMEC 100	3

FMSC 200	3
Social Science elective ¹	6
Electives ²	21
Total	60

Third and Fourth Years

Course	Credits
HUNE 201	6
HUNE 205	3
HUNE 209	3
HMEC 300	3
HMEC 352	3
HMEC 354	3
HMEC 360	3
FMSC 320	3
FMSC 338	3
FMSC 364	3
FMSC or HMEC electives ³	6
Electives ²	21
Total	60

Specialization Option

First and Second Years

Course	Credits
ECON 100	6
ENGL 112	3
One of ENGL 110, 111, 120 or 121	3
HMEC 100	3
FMSC 200	3
Social Science or Humanities Elective ¹	6
Science requirement (see Specialization Requirement) ²	6-12
Electives ²	21-30
Total	60

Third and Fourth Years

Course	Credits
HMEC 300	3
Specialization Requirements	33
Electives ²	24
Total	60

¹ Choose from: PSYC 100, SOCI 100 or other 100- or 200-level social science courses chosen in consultation with adviser.

² Electives to be chosen in consultation with adviser.

³ For **Specialization in Family Life Education:**

Six credits from: BIOL 110, 115, 120, 314, 345 or 346; FMSC 436

One of: FMSC 320, 324 or 420

One of: FMSC 316 or 414

One of: FMSC 312, 314, 322, or 326

One of: FMSC 338, 340, 342, or 440

Fifteen credits of FMSC or HMEC electives

STAT 203

For **Specialization in Family Consumer Services:**

BIOL 110 or BIOL 115 and 120

CHEM 103

FMSC 338, 340 and 342

One of: FMSC 320, 322, 324, 326, 420, 422, 436, 440, 442

One of: FMSC 312, 314, 316, 414

Six credits of FMSC or HMEC electives

Twelve credits from one of the following areas:

Clothing and Textiles

HMEC 352, 354, 356, 360, 366, 406, 450, 452, 454, 456; FMSC 350

Foods and Nutrition

HUNE 201, 205, 209, 304, 308

Human Nutrition Program in Nutritional Sciences B.Sc.

The Human Nutrition Major in Nutritional Sciences is an academic program open to students registered in the Faculty of Science. Students should consult the Faculty of Science section of the *Calendar* for the general Faculty requirements and regulations pertaining to the Major.

The program in Nutritional Sciences is specifically intended for those students interested in basic nutritional sciences, who desire preparation for graduate study and

research in Nutrition, and for students who plan to proceed to an area of Agriculture or Health Sciences in which a background in nutrition would be of value. All students take required courses in both animal (comparative) and human nutrition, but each student may select additional courses to emphasize one area or the other.

Before registering for each of the second, third, and fourth years of this program, every student must obtain formal program approval from an adviser in either the School of Family and Nutritional Sciences or the Faculty of Agricultural Sciences.

Requirements for the Bachelor of Science Degree

Major

First Year

Course	Credits
BIOL 110 or 115 ¹	3-6
BIOL 120	3
CHEM 121, 122 (110)	6
ENGL 100-level ²	6
PHYS 101 ³	6-9
MATH 100, 104	6
Electives ²	0-6
Total	30

Second Year

Course	Credits
BIOL 200, 204	6
CHEM 250	6
MICB 200	6
Electives ²	12
Total	30

Third Year

Course	Credits
BIOC 301, 302	6
BIOL 300	3
BIOL 363	6
HUNE 303, 307	6
Electives ²	9
Total	30

Fourth Year

Course	Credits
ANSC 321 or FOOD 307	3
ANSC 323 or HUNE 309	3
ANSC 425	3
BIOL 354, 335	6
Electives ²	15
Total	30

¹ Students with at least 80% in Biology 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of BIOL courses. BIOL 120 is required of all students.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 or 121. Three credits of first-year English may be deferred until second year.

³ Students without a credit for Physics 12 will require PHYS 100 prior to PHYS 101.

⁴ Chosen from 100-level Arts or Science courses or 200-level BIOL courses.

⁵ Electives must satisfy the following:

- At least 12 credits must be for courses numbered 300 or higher. At least six of these must be in Arts or Science. HUNE 303, 403, 407, 411, 419, 467; ANSC 420; FOOD 302, 402, 418 may not be used to satisfy the Arts and Science requirements.
- At least 12 credits must be in the Faculty of Arts (in addition to the six credits of 100-level English).
- Six credits can be in any Faculty including Science and can be within the field of the Major.
- Of the remaining credits, nine must be either science electives outside the field of the Major or in Arts. The field of the Major for Nutritional Sciences is defined as all courses in Human Nutrition, Animal Science, Food Science, Biochemistry, Biology, Microbiology, and Physiology.

¹ Students must take either Sequence A: ANSC 321 and 323 or Sequence B: FOOD 301 and HUNU 309. At least 48 credits must be numbered 300 or higher.

² In exceptional cases, credit will be granted for BIOC 300 in place of BIOC 200, 201 and BIOC 302.

³ Recommended courses are BIOL 300, PLNT 321 or another introductory Statistics course as listed in the *Calendar*, under Probability and Statistics courses (see Department of Statistics section, Faculty of Science).

⁴ If not offered, substitute FOOD 402 or FOOD 404.

⁵ At least six credits of electives must be at the 300 and 400 level.

Bachelor of Science in Dietetics B.Sc. (Diet.)

The Dietetics program is designed to provide academic preparation for students interested in pursuing careers as professional dietitians. Graduates of the program may apply for a one year internship following graduation, in order to qualify for membership in the Canadian Dietetic Association or the B.C. Dietitians' and Nutritionists' Association.

Admission Requirements

Please refer to the Admissions section in the General Information section of the *Calendar*.

Required: Mathematics 12, Chemistry 11, Physics 11.

Recommended: Chemistry 12, Biology 11, and as many Food and Nutrition courses at the Grades 11 and 12 levels as possible.

Applicants who cannot meet the requirements exactly as specified should submit a special appeal to the Registrar's Office with their application forms. The Director will consider all appeals.

First Year

Course	Credits
BIOL 110 or 115	3
BIOL 120	3
CHEM 103 ¹ , 110 or 121/122	6
ENGL 112	3
One of ENGL 110, 111, 120 or 121	3
MATH 100	3
MATH 101	3
Social Science Elective ²	6
Total	30

Second Year

Course	Credits
BIOL 200	3
BIOL 201	3
CHEM 230	6
COMM 329	3
HUNU 201	6
HUNU 211	3
MICB 200	6
Total	30

Third Year

Course	Credits
BIOC 302 ³	3
HMEC 300	3
HUNC 305	3
HUNC 307	3
HUNC 321	3
PHYL 303 or BIOL 363	6
Statistics ⁴	3
Elective ⁵	6
Total	30

Fourth Year

Course	Credits
HUNC 401 ⁶	3
HUNC 407	6
HUNC 411	3
HUNC 421	3
Electives ⁶	15
Total	30

¹ CHEM 103 is an acceptable choice even if Chemistry 12 has been completed. Students wishing to enrol in CHEM 110 or 120 are required to take PHYS 110, 115 or 120 concurrently. Social Science electives would be taken in the third and fourth years in place of Electives.

² Choose from: PSYC 100, SOCI 100 or EMSC 200.

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1995-96

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

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to the Forestry Students*

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Introduction

The B.S.F. degree is designed to prepare students for entry into the profession of forestry; the B.Sc. degrees for careers in specialized fields relating to forest sciences, wood sciences and wood-based industries, and conservation, recreation and natural areas management. Education within the Faculty of Forestry can also serve as a foundation for entry into other professions such as teaching and law. Some students will be interested in Forestry simply as a broad education in an important natural resources field.

Because the standards for admission to most Associations of Professional Foresters involve experience and examination following graduation, and a group of core courses which may not be taken by all students, those students not in the B.S.F. programs, but interested in Professional Forestry should design their study plans to satisfy the requirements of the Province in which they plan to register.

Graduate programs are provided through the Faculty of Forestry under the authority of the Faculty of Graduate Studies. The degrees include the following and are designed to enable students who already hold degrees to pursue advanced studies leading to careers in management, research, and education.

- M.F. — in professional and applied scientific aspects of Forestry for students with a B.S.F. degree;
- M.Sc. — in scientific aspects of forestry and wood science for students with a B.Sc., B.Sc. (Agr.), B.A.Sc., B.S.F. or equivalents;
- M.A.Sc. — in Forest Engineering for graduates with a B.A.Sc. degree or equivalent;
- Ph.D. — in fields concerned with the basic scientific or economic aspects of forestry and forest products.

Environment for Learning

The Faculty of Forestry is favourably situated for education of men and women as foresters, wood scientists, forest business administrators and forest biologists. It enjoys the benefits of a large university with good library and other facilities for study. The teaching staff of the Faculty of Forestry is widely diversified. The Forest Engineering Research Institute of Canada (FERIC), Pulp and Paper Research Institute of Canada (PAPRICAN) and the Western Laboratory of Forintek Canada Corp. located on campus cooperate in teaching and research in engineering and forest products. The forests of the University Endowment Lands, adjoining the campus, provide a readily accessible environment for field instruction and research. The adjacent south campus area also has a containerized forest seedling nursery, operated by the Faculty for teaching, research and demonstration purposes.

In addition to the lecture and laboratory classrooms the Faculty of Forestry has two large teaching and research forests; the Malcolm Knapp Research Forest in Maple Ridge comprising an area of 5,156 hectares of coastal forests and the Alex Fraser Research Forest, near Williams Lake, comprising some 8,000 hectares of interior forests. Formal field classes, special studies and professional exercises are conducted by students at each of these forests.

Beyond the formal boundaries of the Faculty of Forestry the province of British Columbia provides, within reasonable travel access, one of the most diversified patterns of biotypes anywhere in the world. Throughout the region many different forest resources management and utilization practices may be observed by students on scheduled field trips or during summer employment.

The Faculty of Forestry

Forestry is the science, art, and practice of managing and using wisely the natural resources associated with and derived from forest lands. These resources include wood products, water, forage, soil and stream productivity, wildlife, recreation and environmental quality.

The Faculty of Forestry offers four-year degree programs leading to:

- B.S.F. Major in Forest Resources Management
Major in Forest Operations
- B.Sc. (Natural Resources Conservation)
- B.Sc. (Forestry)
Major in Wood Science and Industry
Major in Forest Science

There is also a Diploma in Forestry (Advanced Silviculture).

Detailed information on graduate programs may be obtained from the Faculty of Graduate Studies section of the *Calendar*.

Admission

B.S.F. and B.Sc. (Forestry)

The Faculty of Forestry will accept applications from students with varying educational preparation:

- 1) directly from secondary graduation;
- 2) following completion of university-level work at UBC or the equivalent at another post-secondary institution;
- 3) after the completion of a two-year Forestry, Wood Products or Engineering diploma program at a recognized college or institute of technology; or
- 4) from an approved one- or two-year Forestry transfer program at a B.C. College.

Achievement of the minimum academic requirements outlined in this section of the *Calendar* and in the Admissions section does not guarantee admission to these programs. Should the number of applicants to first-year Forestry exceed the number of available spaces, the admission of applicants from other post-secondary institutions will be determined competitively on the basis of admission average. The majority of applicants from secondary school will also be admitted on the basis of admission average, calculated as the average of four specified Grade 12 subjects (see the Admissions section of the *Calendar*).

However, approximately ten applicants from secondary school who meet minimum academic requirements, but who do not meet the requisite competitive average for admission, will be selected for admission by the Admissions Committee of the Faculty of Forestry on the basis of additional information provided on a Supplementary Application Form. Such applicants may also be interviewed. All applicants who do not meet the admission-average cutoff for early admission will be sent a copy of this form, with an invitation to submit it for possible consideration by the Admission Committee. Submission is optional. The Admission Committee will consider all applicants who submit a Supplementary Application Form

and who have a final grade minimum average equal to or above the minimum average for admission to the University (67%).

Students entering from secondary school must have met the general University entrance requirement (see General Information section of the *Calendar*), including Mathematics 12, two of Biology 11, Chemistry 11, Physics 11 (all three are strongly recommended), and one of Chemistry 12 or Physics 12. Students entering the Wood Science and Industry major must have Physics 12.

Students who enter the B.S.F. or B.Sc.(Forestry) programs following the completion of at least 30 credits of work at UBC, or its equivalent at another post-secondary institution, must have attained an overall average of at least 60% in all credits attempted. Students entering with less than 30 credits of university level work must also meet the secondary school requirements outlined above.

On entry into the Faculty of Forestry, students must select one of four major programs: Forest Resources Management, Forest Operations, Wood Science and Industry, or Forest Science. To be eligible for second year of Forest Resources Management or Forest Operations, students must have completed 30 credits or more of university-level work, including six credits of first-year English; Mathematics 100 and 101 (or 140 and 141 for the Forest Management major); Biology 120 and one of: Biology 110 or 115 or Biology 12 with a grade of 80% or better; and either Physics (100 and 101 or 101 and 102) or Chemistry (103 or 110 or 121 and 122), or an equivalent. If either Chemistry or Physics has not been taken at the Grade 12 level, it must be the subject included in the above-stated requirements. Moreover, it is recommended that students include both Chemistry and Physics in their First-Year program. To be eligible for second year of the Forest Science major, students must have completed six credits of first-year English; Biology 120 and one of: Biology 110 or 115 or Biology 12 with a grade of 80% or better; Mathematics 100 and 101 (or 140 and 141); and Chemistry (103 or 110 or 121 and 122). To be eligible for second year

of the Wood Science and Industry major, students must have completed six credits of first-year English, Mathematics 100 and 101 (or 120 and 121, or 153 and 154), Chemistry (103 or 110 or 120 and 121) and Physics (101 or 170). Students lacking Biology 12 must also have completed Biology 110 or 115 for the Wood Science and Industry major. The major programs are designed to allow completion in three years following at least one year (30 credits) of university-level work.

Applicants graduating from a two-year Forestry Technology diploma program must have achieved an overall average of at least 65% in their program. Provided that students have the science and mathematics requirements from secondary school graduation as outlined above, consideration will be given to individual cases of study in determining the exemptions that may be applied to the Forestry degree program.

Application for admission by students or graduates of other universities, colleges, or other faculties will be reviewed individually. It may be possible to design study programs for such applicants that meet Forestry degree requirements in less than the full four years. Transfer students may be required to validate advanced standing in a given subject by passing an examination.

Applicants who are uncertain about the selection of a major, and those who lack some of the required courses but may have other advance credit, are urged to consult the Coordinator of Student Services of the Faculty of Forestry.

Undergraduate students with the necessary background and the permission of the instructor concerned may be allowed by the Dean to register in a regularly scheduled graduate course in Forestry.

B.Sc. (Natural Resources Conservation)

The Faculty of Forestry will accept applications from students with varying educational preparation:

- 1) directly from secondary graduation;
- 2) following completion of at least 30 credits at UBC or its equivalent at another post-secondary institution.

Students entering from secondary school must have met the general University entrance requirements (see the General Information section of the *Calendar*) and have completed Mathematics 12 and Chemistry 11. Students who enter following completion of at least 30 credits of work at UBC or its equivalent at another post-secondary institution, must have attained an overall average of at least 60% in all credits attempted. In the case of transfer students, consideration will be given to individual cases of study in determining the transfer credit that may be applied to the Natural Resources Conservation degree program.

Graduation Requirements

Each one of the undergraduate programs in Forestry consists of a minimum of four years of university study.

The required first year courses vary for each of the five programs. Students are encouraged to indicate their preference for their program of study prior to entering the Faculty of Forestry. However, it may be possible to select courses for the first year in such a way as to enable the student to delay the choice of program until after the first year. Students who wish to do so should consult with a faculty adviser when selecting their courses.

English Requirements

To qualify for the degree of B.S.F., B.Sc. (Forestry), or B.Sc. (Natural Resources Conservation), students must

satisfy the English Requirement of the Faculty of Forestry. To do this, students must obtain credit for two of English 110, 111, 112, 120 and 121.

All students prior to entering first-year English courses at the University of British Columbia are required to write the Language Proficiency Index (LPI) examination. Returning UBC students who have not yet completed six credits of first-year English, will also be required to take the LPI examination. (For further details, refer to the *Calendar* index under Language Proficiency Index.)

Those students whose LPI scores are below the required level for entrance into first-year English courses are advised to take a non-credit writing course in the University Writing Skills Centre and may not register for more than 12 credits of course work per term. Upon being permitted to enrol in first-year English courses, these students must do so at the first opportunity.

Students must complete the English requirement before entering the Third Year of their program, or within one year of first registering at UBC, whichever date is later.

Part-time Studies

In cooperation with Guided Independent Study, credit correspondence courses are available for persons who wish to work towards degree completion, but cannot attend regular full-time on-campus programs. These courses are also accredited by the Association of British Columbia Professional Foresters towards completion of requirements for RPF status. Part-time daytime studies on campus can also be arranged. Information on non-credit professional continuing education courses is available through the Provincial Office of the B.C. Forestry Continuing Studies Network on campus.

Exchange Program with Canadian Faculties of Forestry

Students who maintain a satisfactory academic standing may spend Second or Third Year at another Canadian Faculty of Forestry, provided the Faculty of Forestry at The University of British Columbia gives credit for the course-work chosen. The visited university collects the normal fees. Though at this time there is no financial assistance for such exchanges, the experience of a different teaching milieu should be of considerable value. At the University of British Columbia, the third year is recommended for these exchanges. Students considering exchange should consult the Associate Dean to arrange their programs before the end of April. Scholarships and bursaries awarded by The University of British Columbia are not available for studies at other universities. Recipients of such awards should normally be able to reserve them for one year until their return to the University of British Columbia.

Field Work

In the four-month period May through August, students are encouraged to obtain practical experience not obtainable in laboratory or field classes. Great importance is placed on this phase of the student's training and the candidate should gain experience relative to the area of interest selected. In addition short field exercises are required from time to time throughout all four years. Such exercises are often scheduled on weekends. Attendance is mandatory and students are responsible for expenses incurred.

Extra-session Courses

Three courses in the Forestry programs are taken outside the normal academic year. These are Forest Operations

263, Basic Forest Surveying, preceding second year; Forestry 351, Interior Field School, preceding third year; and Forestry 451, Field Work in Forest Operations, Silviculture and Mensuration immediately following third year. Students requiring these courses in their program are advised to take them in the correct sequence to ensure steady progress and timely completion of degree programs.

Program Approval

As part of the registration procedure each student must select a program of courses within the limitations of the requirements for the degree and course schedules. Normally there will be a faculty adviser for each of the five programs and one for first year and for students transferring into Forestry. In case of conflicts between individual students and their faculty advisers, the student may appeal to the Dean. It is the student's responsibility to select a schedule that allows attendance of all regularly scheduled lectures and laboratories.

Examinations and Advancement

The University regulations concerning examination and advancement as listed under General Information in the *Calendar*, apply. In addition, the Faculty of Forestry sets the following requirements:

- 1) Standing and awards will be based on the average mark of all courses attempted in any one year. Only those students who have completed at least 90% of the required in session program will be considered for awards.
- 2) Students who wish to drop courses may do so within two weeks of the start of the course for one term courses and three weeks for two term courses, by obtaining permission from the appropriate undergraduate adviser. After this deadline courses may only be dropped under exceptional circumstances and with the approval of the Associate Dean. Those who fail to write the final examination or who do not complete other course requirements and when circumstances do not warrant deferred standing, will be assigned an F standing. Supplemental privileges will not be granted in such instances.
- 3) Honours standing on graduation will be granted to those students who have completed at least 90% of the required course work during each of their final three years without failures or supplementals, and who have obtained 80% standing during their final year and at least 75% in each of the two preceding years.
- 4) The passing mark in Forestry is 50%. In subjects comprising both lecture and laboratory or problem sessions, the candidate must pass both. If a candidate fails to obtain 50% 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 the record of the candidate as an adjudicated pass.
- 5) If a student fails a course and is required to take it again, exemption from the laboratory or problem session portion of such a course may be granted.
- 6) Only those students with an average grade of 60% or more in 30 credits during their first year will be eligible for entry to Second Year Forestry. Students who fail to achieve this standing will be required to withdraw from the faculty for at least one year. In subsequent years, students who do not pass at least 60% of the course work undertaken or who do not achieve an overall average of 50%, will be required to withdraw from the faculty for at least one year.

- 7) A candidate who does not complete studies for graduation in May following Fourth Year, will be required to register for all incompleting subjects, in a subsequent session, summer or winter, and will be assessed the prescribed fees for these subjects. Students who do not complete **Forestry 499, B.S.F. Thesis; Forestry 498, B.Sc. Thesis; Cons 498, Thesis or Special Project; or Forestry 497, Graduating Essay** in their Fourth Year must complete these requirements in time for graduation in the fall of the following year. Students who do not complete their thesis or graduating essay within the specified period of time must formally reregister in the B.S.F. or B.Sc. program in a subsequent session and must spend at least one term in residence in order to complete this requirement, and may be required to take additional courses related to the thesis or essay topic.

Supplemental Examinations

In addition to General Academic Regulations under General Information in the *Calendar*, the Faculty of Forestry will apply the following guidelines for the granting of supplemental examinations:

- 1) Supplemental examination privileges will be granted in a course provided:
 - a) The normal final exam has been written and a grade submitted.
 - b) The grade attained is at least 40%.
 - c) The overall average for the year including the failed courses is at least 60%.
- 2) Notwithstanding eligibility under 1, supplemental examination will not be granted if:
 - a) The failure is due to a substandard performance in the laboratory part of a course.
 - b) In Departments outside Forestry, supplementals are not offered.
- 3) In no case shall supplemental examination privileges be granted in more than two courses or more than nine credits, whichever is the lower.

Awards and Financial Aid

Undergraduate Forestry students are eligible for a range of assistance including prizes, scholarships, bursaries and loans. Prizes and scholarships are awarded on the basis of academic standing although other factors may also be considered. Many scholarships are awarded on the recommendation of the Faculty, while others are assigned by the Awards Office. In the last academic session, approximately 35 students received academic awards totalling \$50,000. The University also offers bursaries to students demonstrating financial need. These awards are assigned by the Awards Office and students are required to submit a detailed application outlining their financial circumstances. Bursaries to Forestry students amount to about half the value of scholarships and prizes. The major source of financial assistance is available through the British Columbia Student Assistance Program which combines a Canada Student Loan and a British Columbia Student Loan. Details on these programs are contained in a supplement to the UBC *Calendar* called *Awards and Financial Aid*. Students who wish to be considered for awards and financial assistance are urged to consult this supplement which is available in the spring from the Awards Office.

Forest Resources Management Major (B.S.F.)

The study program in Forest Resources Management is designed to educate thoughtful, responsible and adaptable professionals with a comprehensive understanding of the discipline, an ability to acquire specific knowledge and skills as required, and the confidence to play a decision-making role in a wide variety of resource management situations. Additionally, the program provides a foundation for advanced studies in many aspects of forest resources management. Graduates, after appropriate work experience and examination, should be eligible for registration as professional foresters.

Forest Resources Management is a broad undergraduate degree program which involves all aspects of forest resources biology and management. The resources considered include fisheries, range, recreation, timber, water and wildlife. The core program provides students with an introduction to the biological, physical, and social sciences upon which forest resource management is based; a working knowledge of the characteristics of forest resources, their interactions, and the ways in which they can be manipulated to yield a socially optimum mix of goods and services; an ability to use quantitative and interpersonal skills necessary in the management of forest resources and an awareness of the technologically advanced tools and techniques available to resource managers; an understanding of the political and socio-economic environment in which forestry is practised; and, an appreciation for the historical and ethical foundations of the profession. Through their choice of electives, students may emphasize biological, economic, social or quantitative aspects of resources management. Throughout the program, emphasis is placed on encouraging communicative skills, both oral and written; creative thinking; critical analysis and professional pride.

For students entering the Faculty of Forestry from senior secondary school, the program consists of a minimum of 131 credits of in-session and 11 credits of extra-session course work, normally taken over a four-year period. For those students entering the Faculty of Forestry from first year university (or its equivalent), the program consists of a minimum of 101 credits of in-session and 11 credits of extra-session course work, normally taken over a three-year period. For B.C. Forestry Technology Graduates, the program consists of a minimum of 105 credits of in-session and nine credits of extra-session course work, normally taken over a three-year period.

Students Entering from Secondary School

First and Second Year

Course	Credits
BIOL ¹ 110 and 120 or 115 and 120	6
CHEM ¹ 103, or 110 or 121 and 122 or ² PHYS ¹ 100 and 101	6
Two of: ENGL 110 ¹ , 111, 112, 120 and 121	6
ECON 100	6
MATH ¹ 100	3
MATH ¹ 101	3
FRST ¹ 100	2
FRST ¹ 111	6
FRST 202	3
FRST 203	3
FRST 231	3
FRST 232	3
FRST 237	3
SOIL 200	3
SOIL 204	3

Electives ¹	6
Total	65
FOPR ² 263	2

Students Entering from First-Year Science

Second Year

Course	Credits
ECON 100	6
FRST 100	2
FRST 111	6
FRST 202	3
FRST 203	3
FRST 231	3
FRST 232	3
FRST 237	3
SOIL 200	3
SOIL 204	3
Total	35
FOPR ² 263	2

Common for Students Entering from Secondary School or First-Year Science

Third Year

Course	Credit
FRST 238	3
FRST 305	3
FRST 306	3
FRST 308	2
FRST 309	2
FRST 319	3
FRST 327	2
FRST 332	3
FRST 387	3
FOPR 262	3
FOPR 362	3
Elective	3
Total	33
FRST ² 351	3

Fourth Year

Course	Credit
FRST 290	3
FRST 395	3
FRST 415	2
FRST 421	3
FRST 423	3
FRST 445	2
FRST 497 or 499	2 or 6
WOOD 475	3
Humanities or Social Science Elective	3
Electives ²	9 or 5
Total	33
FRST ² 451	6

Three-year Program in Forest Resources Management Major for B.C. Forestry Technology Graduates

Second Year

Course	Credits
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100	3
MATH 101	3
BIOL 110 and 120, or 115 and 120	6
CHEM 103, or 110 or 121 and 122, or ² PHYS 100 and 101	6
FRST 111	6
FRST 231	3
FRST 232	3
Total	36

Third Year

Course	Credits
ECON 100	6
SOIL 200	3

SOIL 204	3
FRST 202	3
FRST 203	3
FRST 238	3
FRST 290	3
FRST 332	3
FRST 387	3
FOPR 362	3
Elective	3
Total	36
FRST ¹ 351	3

Fourth Year

Course	Credits
FRST 305	3
FRST 306	3
FRST 319	3
FRST 395	3
FRST 423	3
FRST 421	3
FRST 415	2
FRST 415	2
WOOD 475	3
FRST 497 ² or 499	2 or 6
Electives ³	6 or 2
Total	33
FRST 451	6

¹ Recommended for first year.² Select the subject(s) not taken at the Grade 12 level.³ It is recommended that all students use this elective freedom to complete both First Year Chemistry and Physics.⁴ Immediately preceding second year.⁵ Immediately preceding third year.⁶ Those students who elect 497 require nine credits; those who elect 499 require five credits. Courses should be chosen in consultation with a Faculty adviser.⁷ Immediately following third year.⁸ Those students who elect 497 require 6 credits; those who elect 499 require two credits. Courses should be chosen in consultation with a Faculty adviser.

Forest Operations Major (B.S.F.)

The Forest Operations Major prepares the graduate for a full range of professional responsibilities associated with forest land use. The program includes core courses in forest ecology, stand management, silvicultural systems, forest protection, fisheries, hydrology, wildlife, and integrated resource management that are common to the Forest Resources Management Major. In addition, the Forest Operations Major offers specialized courses in geotechnical engineering, forest road design and location, planning of forest operations at the stand and landscape levels, engineering and economic analysis of logging systems and forest transportation systems. Graduates of the Forest Operations Major have the unique skills that are needed to analyze, plan and implement a wide range of silviculture, logging and transportation systems which are key elements in forest management. After appropriate work experience and examination, graduates are eligible for registration with the Association of B.C. Professional Foresters.

For students entering the Faculty of Forestry from senior secondary school, the program consists of a minimum of 131 credits of in-session and 11 credits of extra-session course work, normally taken over a four-year period. For those students entering the Faculty of Forestry from first year science (or its equivalent), the program consists of a minimum of 110 credits of in-session and 11 credits of extra-session course work, normally taken over a three year period. For Forestry Technology graduates, the program consists of a minimum of 102 credits of in-session

and nine credits of extra-session course work, normally taken over a three-year period.

Students Entering from Secondary School

First Year

Course	Credits
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100 and 101	6
One of:	6
BIOL 110 and 120, or	
CHEM 105 or 110 or 121 and 122, or	
PHYS 100 and 101	
FRST 111	6
FRST 231	3
FRST 232	3
FRST 100	2
Total	32

Second Year

Course	Credits
ECON 100	6
SOIL 200	3
FRST 202	3
FRST 203	3
FRST 237	3
FOPR 262	3
FOPR 362	3
PHYS 170	3
Electives	6
Total	33
FOPR 263 ¹	2

Third Year

Course	Credits
FRST 238	3
FRST 305	3
FRST 306	3
FRST 308	2
FRST 309	2
FRST 327	2
FRST 332	3
FRST 387	3
FRST 495 or FRST 395	3
FOPR 260	3
FOPR 363	3
WOOD 376 or CIVL 230	3
Total	33
FRST 351 ²	3

Fourth Year

Course	Credits
FRST 415	2
FRST 421	3
FRST 423	3
FRST 442	3
FRST 445	2
FRST 497	2
FOPR 359	3
FOPR 459	3
FOPR 463	3
FOPR 464	3
WOOD Elective	3
Elective	3
Total	33
FRST 451 ³	6

¹ Select one not taken at Grade 12 level. Physics 12 or equivalent is required by start of second year.² Week immediately preceding second year.³ Seven days of field study immediately preceding third year.⁴ 18 working days of field study immediately following third year.

Students Entering from First-Year Science (or its equivalent)

See Faculty of Forestry Admission requirements.

Second Year

Course	Credits
ECON 100 ¹	6
PHYS 170	3
SOIL 200	3
FRST 100	2
FRST 111	6
FRST 202	3
FRST 203	3
FRST 231	3
FRST 232	3
FRST 237	3
FOPR 262	3
FOPR 362	3
Total	41
FOPR 263 ²	2

Third Year

Course	Credits
FRST 238	3
FRST 305	3
FRST 306	3
FRST 308	2
FRST 309	2
FRST 327	2
FRST 332	3
FRST 387	3
FRST 495 or FRST 395	3
FOPR 260	3
FOPR 363	3
WOOD 376 or CIVL 230	3
Elective	3
Total	36
FRST 351 ³	3

Fourth Year

Course	Credits
FRST 415	2
FRST 421	3
FRST 423	3
FRST 442	3
FRST 445	2
FRST 497	2
FOPR 359	3
FOPR 459	3
FOPR 463	3
FOPR 464	3
WOOD Elective	3
Elective	3
Total	33
FRST 451	6

¹ Week immediately preceding second year.² Seven days of field study immediately preceding third year.³ Eighteen working days of field study immediately following third year.⁴ Due to the heavy course load in second year, it is strongly advised to complete ECON 100 before entering this program.

Students Entering as Forestry Technology Graduates

Second Year

Course	Credit
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100	3
MATH 101	3
Select six credits from one of:	6
BIOL 110 and 120, or 115 and 120, or	
CHEM 105 or 110 or 121 and 122, or	
PHYS 100 and 101	
SOIL 200	3
FRST 111	6
FRST 231	3
FOPR 362	3
Total	33

Third Year

Course	Credits
ECON 100	6
PHYS 170	3
FRST 202	3
FRST 203	3

FRST 238	3
FRST 332	3
FRST 387	3
FRST 495 or FRST 395	3
FOPR 260	3
FOPR 363	3
WOOD 376 or CIVL 230	3
Total	36
FRST 351 ²	3

Fourth Year

Course	Credits
FRST 305	3
FRST 306	3
FRST 415	2
FRST 421	3
FRST 423	3
FRST 445	2
FRST 497	2
FOPR 359	3
FOPR 459	3
FOPR 463	3
FOPR 464	3
WOOD Elective	3
Total	33
FRST 451 ¹	6

¹ Select the one not taken at the Grade 12 level. Physics 12 or equivalent is required by the start of third year.

² Seven days of field study immediately preceding third year.

³ 18 working days of field study immediately following third year.

B.Sc. (Natural Resources Conservation)

This is an interdisciplinary program designed to prepare students for careers in the conservation of renewable natural resources, the management of protected areas, and planning for the integrated use of forests and associated wildlands. The program provides students with an understanding of the natural and social sciences underlying the conservation and management of resources associated with wildlands, an appreciation for the political and socioeconomic environments in which decisions concerning the establishment and management of protected areas are made, and a working knowledge of technologically advanced tools and quantitative techniques available to renewable resources planners and managers. Throughout the program, emphasis is placed on developing communicative skills, both oral and written, including approaches to public participation in natural resources planning and the techniques of conflict resolution.

The program consists of 129 credits over a four year period. Following a two year common core of 63 credits, students must choose one of three areas of concentration: nature conservation, wildland recreation and parks management; wildlife management; or conservation and natural resources planning. Each area of concentration consists of 66 sessional credits including 30 credits common to all programs.

First Year

Course	Credits
BIOL 110 and 120, or 115 and 120	6
CHEM 103 ¹	6
GEOG 101	6
FRST 111	6

Second Year

Course	Credits
SOIL 300 or SOIL 200 ²	3
FRST 202	3
FRST 203	3
CONS 200	3
PHIL 120	3

¹ Students with MATH 100 and 101 and a first-year physics course may replace CHEM 103 with CHEM 110 or 121 and 122.

² Students wishing to meet Registered Professional Forester requirements must take SOIL 200.

First or Second Year

Course	Credits
FRST 232	3
ECON 100	6
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100 or 140	3
PSYC 100 or SOCI 100 ¹	6
Total number of credits	63
First and Second Years:	63

¹ SOCI 100 must be taken by students planning to enter third area of concentration or if planning to take SOCI 360 as an elective.

Areas of Concentration**Nature Conservation, Wildland Recreation and Parks Management****Third Year**

Course	Credits
FRST 231	3
FRST 302 or AGSC 213	3
CONS 320	3
CONS 330	3
FRST 290	3
FRST 292	3
FRST 392	3
PHIL 435	3
Electives ¹	9
Total	33

Fourth Year

Course	Credits
FRST 305	3
FRST 306	3
FRST 495	3
CONS 440	3
FRST 490	3
CONS 481	3
CONS 491	2
CONS 498	4
Electives ¹	9
Total	33

¹ Electives must be chosen in consultation with a Faculty adviser. At least six credits must be chosen from the following: ENGL 301; SOCI 360; POLI 302; LAW 356; ECON 370, ECON 371.

Wildlife Management**Third Year**

Course	Credits
FRST 231	3
FRST 302 or AGSC 213	3
FRST 305	3
FRST 306	3
CONS 320	3
CONS 330	3
FRST 395	3
BIOL 204	3
PHIL 435	3
Electives ¹	6
Total	33

Fourth Year

Course	Credits
FRST 495	3
CONS 440	3
ANSC 424	3
BIOL 427	3
CONS 430	3
BIOL 408	6
CONS 491	2
CONS 498	4
Electives ¹	6
Total	33

¹ Electives must be chosen in consultation with a Faculty adviser. At least six credits must be chosen from the following: BIOL 205; ENGL 301; LAW 356; FRST 290; FRST 387; PLNT 404.

Conservation and Natural Resources Planning**Third Year**

Course	Credits
FRST 231	3
FRST 302 or AGSC 213	3
CONS 320	3
FRST 305	3
FRST 306	3
FRST 387	3
FRST 422	3
ECON 374	3
PHIL 435	3
Electives ¹	6
Total	33

Fourth Year

Course	Credits
FRST 495	3
CONS 440	3
CONS 491	2
CONS 481	3
SOCI 360	3
ECON 370	3
CONS 498	4
Electives ¹	12
Total	33

¹ Electives must be chosen in consultation with a Faculty adviser. At least six credits must be chosen from the following: ENGL 301; ECON 371; POLI 302; LAW 356; CONS 330; FRST 392; FRST 445.

Courses Towards Registration as a Professional Forester in the Province of British Columbia

Students in the B.Sc. (Natural Resources Conservation) program who wish to work towards membership in the Association of B.C. Professional Foresters are advised to include courses from the following list in their choices of electives. Students should contact the Association of Professional Foresters directly for information on their individual requirements.

Course	Credits
SOIL 200	3
FRST 237 ¹	3
FRST 238 ¹	3
FRST 308	2
FRST 309	2
FRST 319	3
FRST 327	2
FRST 421	3
FRST 423	3
FOPR 262 ²	3

¹ Students wishing to take these courses must have completed MATH 101 or MATH 141.

² This course has a prerequisite requirement of FOPR 263.

Wood Science and Industry Major B.Sc. (Forestry)

The Wood Science and Industry Major is designed to give students a knowledge in wood as a material and a good understanding of wood products manufacturing, marketing, engineering and utilization. Three areas of concentration (or options) which include: 1) Business Management and Marketing, 2) Industrial Process Technology and 3) Science, Engineering and Biotechnology provide for a wide range of specialization. Graduates will be educated to qualify them for employment in many facets of the wood products industry in both technical and managerial positions.

The program consists of a minimum of 128 credits in-session and five credits of extra-session course work (Total of 133 credits).

No later than end of second term of the second year, each student will be required to select one of three areas of concentration (or options). These sequences of courses are designed to broaden the student's knowledge in one of the specific areas: Business Management and Marketing, Industrial Process Technology and Science, Engineering and Biotechnology. The Business Management sequence, which has been designed in cooperation with the Faculty of Commerce and Business Administration, is designed for students interested in business and financial aspects of the forest products industries. The Industrial Process Technology option provides background in electronic, statistical and numerical process control, particularly for sawmilling and wood processing. The Science, Engineering and Biotechnology stream provides the scientific education for wood scientists wishing to specialize in wood-products development, manufacture and processing, wood engineering or chemical and microbial (biotechnological) processing of wood and biomass.

BCIT Wood Products diploma graduates who meet the entrance requirements for first year Science at UBC (or with equivalent first year science credits) and who have completed their BCIT diploma with at least a 65% average in all courses taken, are now admissible into a three year B.Sc. in Wood Science and Industry degree program. The specific sequences of courses are also designed to meet entrance requirements for post graduate work in Wood Science and Industry at UBC or other graduate schools.

Wood Industries Cooperative Education Program

The Wood Industries Cooperative education program is designed to provide qualified students with work experience integrated with their academic programs. Admission to the program is limited and based on:

- Academic qualifications and progress;
- Letters of reference;
- Interviews with faculty advisers and industrial sponsors.

The work program is a year round program based on three sessions of targeted employment consisting of the following: one summer work placement (WOOD 310), one Winter Session Term 1 placement (WOOD 300) and one Winter Session Term 2 placement (WOOD 400). The full program requires five years to complete. The program is available for all three areas of concentration within the Wood Science and Industry Major. Students accepted into the program will register in the appropriate non-credit Cooperative Education Courses (see detailed listing of Wood Science courses in Courses of Instruction Section).

Students are expected to write technical reports detailing their activities in the Winter Term placements. The first Winter Term placement will result in a three credit technical essay given for WOOD 448 (see course listing), and the second Winter Term placement should normally be related to the student's graduating essay.

To graduate in the Cooperative Education program the student must complete the required number of work placements along with the normal academic requirements.

Students interested in admission to the program should contact the Department of Wood Science, Room 389, MacMillan Building, University of British Columbia, Vancouver, B.C. V6T 1Z4.

Students Entering from Secondary School

First Year

Course	Credits
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100	3
MATH 101	3
CHEM 103 or 110 or 151	6
PHYS 101 or 170 ¹	3
WOOD 110	2
WOOD 120	3
Electives ^{2,3}	6
Total	32

Second Year

Course	Credits
WOOD 241	3
WOOD 242	3
WOOD 271	3
WOOD 272	3
WOOD 280	3
WOOD 282	3
WOOD 376	3
ECON 100	6
APSC 201	3
Electives ⁴	3-5
Total	33-35

Third Year

Course	Credits
CHEM 230 ⁵ or Chem 260 ⁶	6-4
ENGL 301	3
FRST 332	3
WOOD 335	3
WOOD 371	3
Area of Concentration	15-17
Total	33
WOOD 353 ⁷	2

Fourth Year

Course	Credits
FRST 445	2
WOOD 461	3
WOOD 473	4
WOOD 482	2
WOOD 484	3
WOOD 487	3
FRST 497 or 498	2-6
Area of Concentration	7-11
Total	30
WOOD 448 ⁸	3

¹ PHYS 170 is recommended.

² BIOL 110 must be taken if not completed at Grade 12 level.

³ BIOL 120 must be taken if students wish to pursue science, engineering and biotechnology area of concentration.

⁴ WOOD 110 and 120 are required in place of these electives if not completed in first year.

⁵ For Science, Engineering and Biotechnology option only.

⁶ For Business Management and Marketing and Industrial Processing Technology options instead of CHEM 230.

⁷ Six working days of on-site study of forest products manufacturing plants immediately following spring examinations of second or third year.

⁸ All students proceeding to Fourth year must submit a report based on their summer work experience in the forest industry undertaken the summer preceding the Fourth year. This report must have a minimum of 5,000 words, exclusive of bibliography and appendices and must be submitted no later than the second Monday in October.

Students Entering from BCIT

Student must check with the Undergraduate Advisor for the Department of Wood Science prior to registering for courses. Students who have completed the British Columbia Institute of Technology diploma in Wood Products Manufacturing with an acceptable standing may complete a B.Sc. (Forestry) in the Wood Science and Industry Major by completing the following three-year program.

First Year

Course	Credits
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100	3
MATH 101	3
CHEM 103 or 110 (121/122), or ¹ PHYS 100 and 101	6
BIOL 110 and 120, or 115 and 120	6
FRST 111	6
FRST 100	2
Area of Concentration	3
Total	35

Second and Third Year

Course	Credits
ECON 100	6
PHYS 170	3
CHEM 230	6
FRST 449 ²	1
WOOD 371	3
WOOD 372	3
Area of Concentration	9
Total	31

Fourth Year

Course	Credits
FRST 445	2
WOOD 335	3
WOOD 376	3
WOOD 461	3
WOOD 473	4
WOOD 482	2
WOOD 487	3
FRST 497 or 498	2-6
Area of Concentration	7-3
Total	29

¹ Select the one not taken at Grade 12 level.

² Directed study comprised of laboratory section of WOOD 280.

Areas of Concentration

All areas of concentration require three credits of approved Humanities elective. For list consult the departmental adviser.

Business Management and Marketing

- Second year required course: COMM 457
- Third year required courses: COMM 297, 399, 458, 465
- Fourth year required course: FRST 419
- Fourth year electives; select 6 to 10 credits from:
COMM¹ 329, 392, 393, 394, 397, 410, 491
ECON 201, 355, 360, 361, 365, 370, 371
LAW 356
Or other approved courses

¹ Additional prerequisites may be required by the Faculty of Commerce.

Industrial Processing Technology

- First year: MATH 152, 153 and 154 accepted in place of MATH 100 and 101.
- Second year: CPSC 152 or CPSC 118 can be taken in place of FRST 232.
- Third year: ELEC 251, ELEC 253, ELEC 365, APSC 380
- Fourth year: ELEC 314
Electives all years:
Select six to ten credits from:
MATH 152, 221
ELEC 256, 320, 360, 450, 460, 468
One of: COMM 392, COMM 297, COMM 457

Science, Engineering and Biotechnology

- Second year required course: COMM 457
- Third and Fourth year courses*:
Required course: WOOD 377
Select 15 to 21 credits from:

APSC 278
 BIOC 403, 402, 420
 CHEM 205, 311, 330
 CHML 470, 471
 CIVL 230, 231, 330
 CPSC 118, 210
 FRST 430, 431
 ELEC 256, 259, 380
 MATH 152, 200, 221
 MICB 318, 411, 400
 PHYS 270, 236
 WOOD 470, 476

* Students are required to plan for appropriate prerequisites to these elective courses as they cannot normally be waived.

Forest Science Major B.Sc. (Forestry)

The Forest Science major is for students interested in the biology and dynamics of forest ecosystems. The program provides a strong foundation for careers involving the biological and environmental aspects of forestry, forest conservation, research and teaching. Emphasis is given to education in the basic biological and environmental sciences, particularly with regard to the components and functioning of forest ecosystems.

The program consists of a minimum of 126 credits of in-session and three credits extra sessional course work. The first two years of the program are structured to facilitate transfer to or from a B.Sc. program in the Faculty of Science or the other undergraduate programs given by the Faculty of Forestry.

The first two years of the program have a strong core of foundation courses to ensure scientific breadth. No later than the end of the spring term of the second year, students must select an area of concentration, such as forest ecology, forest entomology or pathology, forest fire science, forest genetics or biotechnology, forest hydrology and aquatic sciences, forest soils, tree physiology, or wildlife ecology. Each area of concentration consists of 15 credits of course work plus a thesis (six credits). Specific academic packages to suit the interests and needs of individual students can be designed. All Forest Science majors must have their program of study approved by the undergraduate adviser of the Department of Forest Sciences.

The recommended program of studies is given below. Part-time students or students with advanced credit should consult the undergraduate adviser of the Department of Forest Sciences before registering in an amended program.

First Year

Course	Credits
BIOL 130 and 120 or 115 and 120	6
CHEM 103 or 110 or 121 and 122	6
Two of: ENGL 110, 111, 112, 120 and 121	6
MATH 100 and 101 or MATH 130 and 141	6
FRST 100	2
FRST 111	6
Total	32

Second Year

Course	Credits
BIOL 200	3
BIOL 201	3
CHEM 230	6
FRST 202	3
FRST 203	3
FRST 231	3
SOIL 200	3
SOIL 204	3
Elective	3
Total	30

Third Year¹

Course	Credits
FRST 302 or AGSC 213 or BIOL 334	3
FRST 306	3
FRST 308	2
FRST 309	2
FRST 311	3
FRST 312	3
FRST 327	2
FRST 387 or GEOG 205	3
FRST 395	3
Area of concentration	6
Electives	4
Total	34
FRST 351 ²	3

Fourth Year

Course	Credits
FRST 399	4
FRST 430	3
FRST 445	2
FRST 495 or BIOL 416	3
FRST 498	6
Area of concentration	9
Elective	3
Total	30

¹ Physics 100 is required for advancement to Third Year for students who do not have credit for Physics 12.

² Immediately preceding Third Year.

Diploma in Forestry (Advanced Silviculture)

The Faculty of Forestry, in cooperation with the Silviculture Institute of British Columbia, offers a Diploma in Forestry (Advanced Silviculture).

The Diploma Program is designed for foresters specializing in silvicultural practice, and focuses on silvicultural theory and principles relevant to Silviculture Prescriptions. A Diploma in Forestry (Advanced Silviculture) will be awarded upon successful completion of the program.

Admission

Admission to the Diploma Program requires a combination of academic and work experience qualifications. Applicants must be Registered Professional Foresters (R.P.F.) with the Association of B.C. Professional Foresters. Applicants must also have a minimum of five years of forest management work experience. Applicants are normally practising foresters, employed with government, industry, or a consulting firm, who are engaged in silviculture or related forest management work.

Requirements for the Diploma in Forestry (Advanced Silviculture)

The Diploma requires the completion of six course modules, each of two weeks duration, for a total of 12 weeks of education. Extensive pre-course reading assignments are also required prior to each course module. The program normally takes three years to complete. In order to qualify for the Diploma, a student must complete all requirements within a maximum of five years.

Residence Requirements and Transfer of Credit

Students are required to attend full-time day and evening sessions for 12 consecutive days for each course module. Classroom sessions are held in several off-campus locations in British Columbia. There is no transfer of credit available either to or from this Diploma Program.

Program Description

The Diploma in Forestry (Advanced Silviculture) concentrates on improving the student's awareness and under-

standing of those subjects that encompass the broad field of silviculture.

Lectureships

The H. R. MacMillan Lectureship in Forestry

The generosity of H. R. MacMillan, C.B.E., D.Sc., LL.D., and the H. R. MacMillan Family Fund enables a series of public lectures in forestry and natural resource conservation by outstanding managers, scientists and politicians working in these fields. These lecturers are available for several days to speak to students, to consult with members of the Faculty, and to address professional and other groups.

The T. E. Burgess and D. E. Lane Memorial Lectureship in Forestry

In memory of Thomas E. Burgess and David E. Lane, Vice-Presidents of long standing with British Columbia Forest Products Limited, a fund has been established by Mrs. Dorothy Burgess and Mrs. Evelyn Lane and Fletcher Challenge Canada Limited to provide for the presentation and publication of special lectures in forestry by outstanding authorities in forestry or the forest industry.

The Leslie L. Schaffer Lectureship in Forest Science

In memory of Leslie L. Schaffer, D.Sc., former executive vice-president of Western Plywood Co. Ltd., a fund has been established by Mrs. Leslie L. Schaffer to finance lectures and publications by visiting forest scientists at the Faculty of Forestry, UBC.

Courses of Instruction

Students from other Faculties may take the courses offered in Forestry provided they have the necessary prerequisites, but in all such cases permission of the instructor must be obtained.

Courses for Graduate Students

Formal lecture courses or seminars are indicated by a single credit value assigned to them. In all problem and research courses, as indicated by a variable number of credits, individual laboratory or field investigations or reviews of literature are usually planned to serve the special interests of individual students. When several students have a similar interest in advanced study, formal lectures or seminars may be given. Staff members other than those directing graduate programs may direct studies in specialized topics for interested students, on the recommendation of the students' program supervisors.

Undergraduate students with the necessary background and permission of the instructor may be allowed by the Dean to register in a regularly-scheduled graduate lecture course in Forestry.

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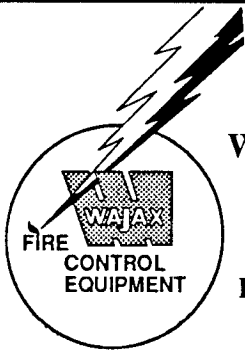
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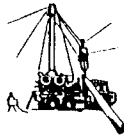
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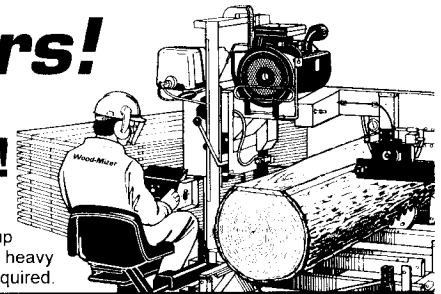
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The Faculty of Graduate Studies works in conjunction with departments, schools and other faculties to coordinate and maintain the quality of all Master's and doctoral programs in the University. Among its functions with respect to graduate students and graduate programs are the following: approving new graduate programs, curriculum changes and graduate level (500 to 699) courses; determining or verifying the admissibility of students applying for graduate programs; maintaining records of the academic performance of all graduate students; approving requests for transfer between programs, leaves of absence, reinstatements after interruptions of study, extensions after the maximum time-in-program has been exhausted; coordinating scholarships, fellowships and awards for graduate students across the entire university; assuring uniformity of practices and standards for doctoral orals; assisting departments and other units with recruitment of new graduate students; helping individual graduate students who encounter problems during their programs; determining whether graduate students are eligible to graduate.

In addition to the above functions, the Faculty of Graduate Studies manages the Individual Interdisciplinary program and a number of other interdisciplinary programs (Genetics, Neuroscience, Occupational Hygiene, Vocational Rehabilitation Counselling). Details of these, as well as graduate programs which operate within other Faculties, are provided below. The Faculty of Graduate Studies also acts as the administering Faculty for the School of Community and Regional Planning, Green College and a number of interdisciplinary centres, institutes, committees and journals. These are also described in the following pages.

Fields of Study and Units Devoted to Graduate Level Research

Advanced Technology Management
 Agricultural Economics
 Agricultural Extension
 Anatomy
 Animal Science
 Anthropology
 Applied Mathematics
 Architecture
 Asian Research
 Asian Studies
 Atmospheric Science
 Astronomy
 Audiology and Speech Sciences
 Biochemistry
 Biology
 Biomedical Engineering
 Bio-Resource Engineering
 Botany
 Chemical Engineering
 Chemistry
 Civil Engineering
 Classical Archaeology
 Classics
 Clinical Pharmacy
 Commerce and Business Administration
 Commerce and Business Administration combined with Law
 Community and Regional Planning
 Comparative Literature
 Computer Science
 Computer Systems Research
 Counselling Psychology*
 Creative Writing
 Curriculum and Instruction in Education*
 Curriculum Studies*
 Dental Science
 Economics
 Educational Psychology and Special Education*
 Educational Studies*
 Electrical Engineering
 Engineering Physics

The Faculty of Graduate Studies

English
 Ethnic Studies
 Experimental Medicine
 Family Studies
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 Fine Arts
 Fire Protection Engineering
 Fisheries
 Food Science
 Forestry
 French
 Genetic Counselling (see Medical Genetics)
 Genetics
 Geography
 Geological Engineering
 Geological Sciences
 Geophysics
 Germanic Studies
 Gerontology
 Greek
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 Health Promotion
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 Human Kinetics
 Human Nutrition
 Human Settlements
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 Pharmaceutical Sciences
 Pharmacology
 Philosophy
 Physics
 Physiology
 Plant Science
 Polar and Alpine Research
 Political Science
 Poultry Science
 Psychology
 Pulp and Paper Engineering
 Rehabilitation Sciences
 Religious Studies
 Remote Sensing
 Resource Management and Environmental Studies Science
 Technology and Society Studies

Social Work
 Sociology
 Soil Science
 Spanish
 Statistics
 Surgery
 Theatre
 Transportation Studies
 Urban Land Economics
 Urban Studies
 Vocational Rehabilitation Counselling
 Westwater Research
 Zoology

* See Education

The titles of the degrees are given beside the headings in the following pages. Where no degrees are listed in the headings, graduate research leading to a degree may be co-ordinated by the Institutes, Centres, Committees, etc. described.

Degrees Offered

Doctor of Philosophy, Ph.D.
 Doctor of Education, Ed.D.
 Doctor of Pharmacy, Pharm.D.
 Combined Doctor of Medicine and Doctor of Philosophy, M.D./Ph.D.
 Doctor of Musical Arts, D.M.A.
 Master of Architecture, M.Arch.
 Master of Advanced Studies in Architecture, M.A.S.A.
 Master of Archival Studies, M.A.S.
 Master of Arts, M.A.
 Master of Applied Science, M.A.Sc.
 Master of Business Administration, M.B.A.
 Combined Master of Business Administration and Bachelor of Laws, M.B.A./LL.B.
 Master of Health Science, M.H.Sc.
 Master of Health Administration, M.H.A.
 Master of Science in Nursing, M.S.N.
 Master of Science in Business Administration, M.Sc.(Bus. Admin.)
 Master of Education, M.Ed.
 Master of Engineering, M.Eng.
 Master of Fine Arts, M.F.A.
 Master of Forestry, M.F.
 Master of Human Kinetics, M.H.K.
 Master of Landscape Architecture, M.L.A.
 Master of Laws, LL.M.
 Master of Library and Information Studies, M.L.I.S.
 Master of Music, M.Mus.
 Master of Arts in Planning, M.A. (Planning)
 Master of Science in Planning, M.Sc. (Planning)
 Master of Social Work, M.S.W.
 Master of Science, M.Sc.

The Degrees of Ph.D., D.M.A., and Ed.D.

A) Admission

- 1) A student may apply for admission to the degree program by writing directly to the department in which the program is offered or by writing to The Dean, Faculty of Graduate Studies, The University of British Columbia, 180-6371 Crescent Rd., Vancouver, British Columbia, V6T 1Z2.

Students are normally admitted to study only in fields which are formally authorized by Senate to offer Doctoral programs. At the time the application form is submitted, all applicants are required to submit a \$50 application fee.

- 2) The number of candidates that can be accommodated is limited, and departments with limited facilities will accept the best qualified students as vacancies occur.
- 3) Most students begin their program at the start of the Winter Session (the beginning of September), but the limitation on the number of students that can be accommodated requires that applicants be selected well before this date.
- 4) Applicants for the Ph.D. and D.M.A. degrees must have completed:
 - a) a Bachelor's degree with First Class Honours (or equivalent) (see C.1 Course Work in this section), or
 - b) a Bachelor's degree with one year of study in a Master's program with 18 credits of First-Class average, of which, normally at least 10 credits must be at the 500-level or above and at least ten credits must be of First Class standing, and clear evidence of research ability or potential (for Ph.D.), or outstanding ability in performance or composition (for D.M.A.) (transfer directly into a Doctoral program is not normally permitted beyond the first year of study and will not be permitted after the completion of the second year in a Master's program); or
 - c) a Master's degree (or equivalent), with clear evidence of research ability or potential (for Ph.D.), or with outstanding ability in performance or composition (for D.M.A.).
- 5) Applicants for the Ed.D. degree must have completed:
 - a) a Master's degree in Education (or equivalent degree); or
 - b) a Bachelor's degree with First Class standing and First Class in Teacher Training, or
 - c) a B.Ed. (Elem.) degree with First Class standing and First Class standing in such prerequisite fifth year work as may have been required.
- 6) Admission to the Ph.D., D.M.A. or Ed.D. program will be in one of the following categories.
 - a) Full Standing: Granted to applicants who have met the requirements in one of the categories indicated in A.4 and A.5.
 - b) Provisional Standing: Granted to applicants with minor deficiencies that must be removed, or in cases where doubt exists.

B) Program of Study

- 1)
 - a) Residency
 - i) Students admitted with a Bachelor's degree normally will be required to spend a minimum of three sessions (each of uninterrupted duration of at least eight months) in full-time status at the University (see "Graduate Student Status" in this section).
 - ii) Students admitted with a Master's degree normally will be required to spend a minimum of two sessions (each of uninterrupted duration of at least 8 months) in full-time status at the University. Departments may recommend a longer residency requirement.
 - iii) For students with Master's degrees and relevant professional experience, the residence requirement may be reduced to twelve consecutive months on campus. Candidates must meet special requirements, details of which can be obtained from the Dean of Graduate Studies.

- b) Students must maintain continuous registration throughout all years until graduation by keeping up with fee payments.
- c) If the degree is not awarded within a period of six years from initial registration, the student's candidacy will be terminated and the student will be required to withdraw from the program. Extension of candidacy will be granted under exceptional circumstances.
 - d) For provisions regarding on-leave status, see "Graduate Student Status" in this section.
- 2) Admitted to Candidacy
 - a) Students normally will be admitted to candidacy when they have completed the residency period, completed all required course work, and passed the comprehensive examination and their research supervisor has certified that their thesis proposal has been approved.
 - b) The Faculty expects that a typical doctoral student will be admitted to candidacy on completion of a two-year residency period. A student who is not admitted to candidacy within a period of three years from date of initial registration will be required to withdraw from the program. Extension of this period may be permitted by the Dean under exceptional circumstances.
- 3) The work of each candidate will be supervised by a Candidate's Committee consisting of not fewer than three members; these may include faculty members from a department other than that in which the candidate is writing the thesis. Changes may be made to the membership of the Candidate's Committee subject to the approval of the major department and the Dean of the Faculty of Graduate Studies.
- 4) Upon registration, the student will consult his or her Committee to develop a program of studies, which is then reviewed and approved by the department concerned. The program of studies will consist of seminars, directed readings, consultations, and such formal courses as may be deemed essential for the fulfilment of the requirements for the degree. Some departments require competence in languages other than English. The department in which the student intends to write the thesis shall determine the number of such languages and the level of competence necessary in each. A major part of the candidate's work will consist of a thesis embodying the results of original research. The Faculty considers this thesis to be a piece of work of high quality which a capable student who is properly prepared, supported and supervised can complete within one to three years of being admitted to candidacy.
- 5) Changes in the program of study may be required during the study period; these must be reviewed and approved by the Candidate's Committee, the major department and the Dean of the Faculty of Graduate Studies.
- 6) The progress of all students working for the Ph.D., D.M.A., and Ed.D. degrees will be reviewed from time to time and at least once a year in the spring by the department concerned and by the Dean of the Faculty of Graduate Studies. A candidate may be required to withdraw if progress has not been satisfactory as shown by course work, the comprehensive examination, progress on the thesis, or other requirements of the Department or the Faculty of Graduate Studies.

C) Course Work

- 1) Each Candidate's Committee will recommend the kind and number of courses to be taken by the student in relation to background and to the requirements which are appropriate to the doctoral level in the chosen major field. Students entering directly from the Bachelor's degree under A.4(a), 5(b), or 5(c) must, during the first year of graduate study, complete 18 credits with a First Class average of which at least 10 credits must be at the 500 level or above and at least 10 credits must be of First Class standing.
- 2) In all courses taken as prerequisites for full entry to a doctoral program, or taken as part of a Qualifying year for a doctoral program, or required to clear Provisional Standing, a minimum mark of 68% must be obtained. When repeating a failed required course a minimum mark of 74% must be obtained. Higher minima may be specified as appropriate.
- 3) Courses listed under department programs may not all be offered regularly. Students should apply to the department concerned for detailed information about courses to be offered in any given year.

D) Examinations and Thesis

- 1) The doctoral student will take the following examinations:
 - a) Course examinations where applicable; a minimum of 68 percent must be obtained.
 - b) A test of the student's ability to read languages other than English where departmental regulations require it.
 - c) A comprehensive examination normally held after completion of all required course work, and intended to test the student's grasp of the chosen field of study as a whole. The Candidate's Committee will set and judge this examination in a manner compatible with the policy of the department concerned. A department may require a formal examination of the thesis before it is transmitted to the Faculty of Graduate Studies for Final Oral Examination. Students should consult their departmental adviser for information about the departmental requirement.
- d) The Final Oral Examination or thesis defence:
 - i) All doctoral theses must be assessed externally. The External Examiner is chosen by the Dean, in consultation with the department concerned, from appropriate specialists outside The University of British Columbia. Procedures for choosing a suitable External Examiner must be initiated at least three months before completion of the thesis. The External Examiner's written report should have been received before the Final Oral Examination takes place.
 - ii) A six-week period is required between the submission of the approved thesis to the Faculty of Graduate Studies and the Final Oral Examination, and all other degree requirements must have been completed. In some departments these requirements include the successful completion of a departmental oral examination of the thesis.
 - iii) The Final Oral Examination is open to all members of the University. Notice of it will be given in the form of a printed program.
 - iv) The Dean will approve the membership of the Examining Committee. The Dean or some-

one designated by the Dean will chair the Examination. The Examining Committee will judge the candidate's success and make its recommendation to the Dean of Graduate Studies.

Further details on examination procedures may be found in the *Final Oral Examination Guide for Doctoral Candidates* available from the Faculty of Graduate Studies.

2) Thesis:

- a) A candidate's thesis must be presented according to procedures and 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, the Faculty of Graduate Studies, or the candidate's department.

Students should consult the Academic Year section of the *Calendar* regarding deadlines for the submission of doctoral theses.

E) Supplementals

Supplemental examinations are not granted to students registered in a graduate program.

F) Low Scholarship

A minimum of 68% (B-) must be achieved in all course work taken for credit. A course in which a grade of less than 68% (B-) was obtained may be repeated for a higher standing, or an alternate course may be taken, if an exemption is recommended by the Department and approved by the Dean of the Faculty of Graduate Studies. If no such recommendation is made, or the recommendation is not approved, the student may be required to withdraw. A student who obtains more than one grade below 68% (B-) will normally be required to withdraw. If progress in research is unsatisfactory a student will be required to withdraw. The research committee should inform the student in writing of unsatisfactory progress before any action is taken regarding withdrawal.

In a course that is repeated, both marks will appear on the transcript. The higher mark will be used to determine promotion in a program and in any decision to admit or withdraw a student from a program. Averages calculated for other purposes will include both marks.

The Degree of Pharm.D.

- 1) A student may apply for admission to the Pharm.D. program by writing to the Pharm.D. Program Admissions Committee, Faculty of Pharmaceutical Sciences, or the Dean, Faculty of Graduate Studies.
- 2) Admission is competitive and class size is limited. All application materials must normally be received by February 1 to be considered for admission in the same year.
- 3) All students are admitted to the program only at the start of the Winter Session (the beginning of September).
- 4) Applicants for the Pharm.D. degree must:
 - a) hold a Bachelor's degree in pharmacy or equivalent, with 80% or higher in at least 12 credits of course work, and at least 74% in the remaining course work in the last two years of the Bachelor of Science in Pharmacy program.
 - b) be eligible for registration as a graduate with the College of Pharmacists of British Columbia. A student with questions regarding eligibility is encouraged to contact the College of Pharmacists of British Columbia.

- 5) Applicants who have a Bachelor's degree, or its academic equivalent, which does not meet the requirements of 4)a) above, but who have had sufficient formal training and relevant professional experience to offset such deficiencies may be granted admission on the recommendation of the Faculty of Pharmaceutical Sciences and approval of the Dean of the Faculty of Graduate Studies.
- 6) A residency in hospital pharmacy practice and/or a minimum of one year's pharmacy experience is preferred.
- 7) Admission to the Pharm.D. program will be in one of the following categories:
 - a) Full standing: Granted to applicants who have met both of the requirements noted in 4) above.
 - b) Provisional standing: may be granted to applicants with deficiencies in 4) b) above.
- 8) There must be clear evidence that the student is competent to pursue studies in the English language. Students may be required to complete a satisfactory TOEFL before any offer of admission can be made.
- 9) The regulations given above (under Ph.D., D.M.A. and Ed.D.) for Low Scholarship and Supplementals also apply to the Pharm.D. program.

Master's Degrees

A) Admission

- 1) A student may apply for admission to the degree program by writing directly to the department in which the program is offered or by writing to The Dean, Faculty of Graduate Studies, The University of British Columbia, 235-2075 Westbrook Mall, Vancouver, British Columbia, V6T 1Z1.
Students are normally admitted only into fields which have been given formal permission by Senate to offer a Master's program.
- 2) The number of candidates that can be accommodated is limited, and departments with limited facilities will accept the best qualified students as vacancies occur.
- 3) Most students begin their program at the start of the Winter Session (the beginning of September), but the limitation on the number of students that can be accommodated requires that applicants be selected well before this date.
- 4) Applicants for a Master's degree must hold a Bachelor's degree or its academic equivalent with
 - a) Honours in the field of the proposed Master's courses with First Class standing in at least 12 credits of Third and Fourth Year course work in that field, or
 - b) First Class standing in at least 12 credits of the course work and at least upper Second Class standing in the remaining course work at the Third and Fourth Year level prescribed by the department concerned as prerequisite to the Master's program.
- 5) Applicants who have a Bachelor's degree, or its academic equivalent, which does not meet the requirements of 4(a) or (b) above, but who have had sufficient formal training and relevant professional experience to offset such deficiencies, may be granted admission on the recommendation of the appropriate department or Faculty and approval of the Dean of the Faculty of Graduate Studies.
- 6) Admission to the Master of Arts in Education and the Master of Education degree programs requires:

- a) an approved Bachelor's degree and one year of teacher education; or
- b) a five-year Bachelor's degree in Education; or
- c) a four-year Bachelor's degree in Education and a 30-credit* program of approved senior course work with First Class standing in at least 12 credits of the senior courses and at least Second Class standing in each of the remaining senior courses prescribed by the Department as a prerequisite to the master's program.

* The 30-credit requirement may be reduced or waived where the Department considers most or all prerequisites already to be met.

In special circumstances, as determined by the Department concerned, completion of a teacher education program may be waived for those applicants who have (a) a university degree with standing sufficient for admission to a Master's program at this University, and (b) adequate experience related to their proposed field of specialization.

- 7) Admission to the Master's program will be in one of the following two categories:
 - a) Full standing. Granted to applicants who hold the Bachelor's degree with the required academic standing appropriate to the field of the proposed Master's program.
 - b) Provisional standing. Granted to students with deficiencies in standing, or who do not have the necessary prerequisites. Prerequisite courses normally are taken in the first year concurrently with courses in the graduate program, but are not counted as credit toward the Master's degree.
- 8) Students completing courses for a Bachelor's degree at The University of British Columbia, who, in order to graduate, are taking not more than 75% of a normal final year course load, may be granted permission to register in courses open to graduate students. Upon application, up to 12 credits of such courses may be counted toward a higher degree only after registering for such a degree.
- 9) Students with a Bachelor's degree who lack prerequisites for a chosen field of graduate study may be permitted to register as Qualifying students for no more than one year. Satisfactory completion of a Qualifying year does not guarantee admission to a graduate program. Up to 12 credits of eligible courses may be applied to the graduate degree program provided prior permission to register in these courses was obtained from the Department and the Dean of Graduate Studies. Qualifying status is granted only to those students who are recommended for such status by the Departments concerned.
- 10) There must be clear evidence that the student is competent to pursue studies in the English language. Students may be required to complete a satisfactory TOEFL (Test of English as a Foreign Language) test before any offer of admission can be made.

B) Program of Study

- 1) The student's program of study must be approved by the department concerned.
- 2) Some departments require competence in languages other than English. The department in which the student enrolls shall determine the number of such languages and the level of competence necessary in each.

- 3) Students must maintain continuous registration throughout all years until graduation by keeping up with fee payments.
- 4) If the degree is not awarded within a period of five years from initial registration, the student's candidacy will be terminated and the student will be required to withdraw from the program. Extension of candidacy will be granted under exceptional circumstances.
- 5) For provisions regarding on-leave status, see "Graduate Student Status" in this section.
- 6) The progress of all students studying for a Master's degree will be reviewed from time to time and at least once a year in the spring by the department concerned and the Dean of the Faculty of Graduate Studies. A candidate may be required to withdraw if progress has not been satisfactory as shown by course work that does not meet the requirements of section D.1 below, an excessive number of credits below 68% or courses with incomplete standing, unsatisfactory progress on the thesis or graduating essay, or failure to satisfy additional requirements of the Department or the Faculty of Graduate Studies.

C) Program Options

Faculty of Graduate Studies regulations for Master's degrees provide for full-time or part-time studies, as well as for programs with thesis and programs without thesis. The choice of these options lies with the individual departments concerned. Departments are also free to prescribe work beyond the minimum requirements described below. Applicants should contact departments directly to determine what options are available.

- 1) Full-time Study
 - a) All programs leading to a Master's degree may be pursued by Full-time study.
 - b) A student in a full-time program must spend at least two consecutive terms (normally September-April inclusive) as a full-time student. (See "Graduate Student Status" in this section.)
 - c) The following programs may be pursued only through full-time study:
 - Chemistry
 - Combined M.B.A./J.L.B.
 - Community and Regional Planning
 - Creative Writing
 - Engineering Physics
 - Family Studies
 - Fine Arts (M.F.A.)
 - Human Nutrition
 - Library and Archival Studies
 - Neuroscience
 - Oceanography
 - Pathology
 - Physics
 - Physiology
 - Surgery
- 2) Part-time Study
 - a) A period in residence is not required. However, courses must normally be taken at the University in order to be credited to a student's program.
 - b) Students must obtain departmental approval to register for part-time study.
 - c) Part-time studies may be pursued in any area other than those listed in C.1. (c) above.
- 3) Program with Thesis

The **minimum** requirements are:

Thesis	6 - 18 credits
Courses numbered 300 or above	24 - 12 credits
Total	30 credits

Note: The combination of thesis and courses numbered 500-699 must total no fewer than 24 credits.

The thesis for the Master of Laws degree is valued at 20 credits.

4) Program without Thesis

The **minimum** requirements are:

Courses numbered 300 or above, including at least 24 credits of courses numbered 500 to 699 30 credits
In addition to the 30 credits, at least one major essay and a comprehensive examination, in the form of a final written and/or oral examination, are required.

D) Course Work

- 1) At least 60% must be obtained in any course taken by a student enrolled in a Master's program for the student to be granted Pass Standing. However, only six credits of Pass Standing may be counted towards a Master's program; for all other courses credited to the program, at least 68% must be obtained.
- 2) In all courses taken as prerequisites for full entry to a Master's program, or taken as part of a Qualifying year for a Master's program, or required to clear Provisional Standing, a minimum mark of 68% must be obtained. When repeating a failed required course a minimum mark of 74% must be obtained. Higher minima may be specified as appropriate.
- 3) Courses listed under the departmental programs may not all be offered regularly. Students should apply to the department concerned for detailed information about courses to be offered in any given year.
- 4) Some courses offered through UBC Access, or other approved means of distance education, may be used as credit toward a graduate degree program. A maximum of six credits is obtainable through these means. Prior approval of the Department and the Dean of Graduate Studies is required.
- 5) Normally a maximum of 12 credits encompassing the categories of transfer credit, off-campus courses, and distance education courses is permitted in a Master's degree program.
- 6) Except as provided in section 8 under Admission, no credit towards the Master's degree will be given for work done prior to registration as a candidate for that degree.

E) Examinations and Thesis

- 1) A comprehensive examination is required for a Master's program without Thesis.
- 2) For a Master's degree with Thesis, departments may, at their discretion, prescribe a comprehensive examination in the field of study and/or a thesis defence.
- 3) In the creative and performing arts, a thesis may consist of creative work (e.g., paintings, writings, etc.) or of a performance, but departments may, at their discretion, require additional supporting documents.
- 4) The thesis must be presented according to procedures and 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 of the Library, the Faculty of Graduate Studies, or the department concerned.

Students should consult the Academic Year section of the *Calendar* regarding deadlines for the submission of Master's theses.

F) Low Scholarship

A minimum of 60% (P) must be achieved in all course work taken for credit. A course in which a grade of less than 60% (P) was obtained may be repeated for a higher standing, or an alternate course may be taken, if an

exemption is recommended by the Department and approved by the Dean of the Faculty of Graduate Studies. If no such recommendation is made, or the recommendation is not approved, the student may be required to withdraw. A student who obtains more than one grade below 60% (P) will normally be required to withdraw. If progress in research is unsatisfactory a student will be required to withdraw. The research committee should inform the student in writing of unsatisfactory progress before any action is taken regarding withdrawal.

In a course that is repeated, both marks will appear on the transcript. The higher mark will be used to determine promotion in a program and in any decision to admit or withdraw a student from a program. Averages calculated for other purposes will include both marks.

General Information

Courses of Instruction

For course descriptions see appropriate departmental listing under "Courses of Instruction".

Summer Session

Some graduate courses are available in Summer Session. Students should consult the Summer Session *Calendar* to learn of the offerings which can be included in their graduate programs.

Language of Thesis

The Doctoral or Master's thesis may be written in either English or French with the approval of the Department concerned.

With the approval of the Dean's office, and the Department concerned, students in language departments may write their theses in the language of their Department. It is understood, however, that the Abstract will be written in English or French; that the Final Oral Defence will be conducted in English or French; and that a 15-to-20 page precis of the thesis, in English or French, will be filed with the thesis.

Language of Study

There must be clear evidence that the applicant is competent to pursue studies in the English language. Applicants whose degrees are from a country other than Canada, USA, UK, Ireland, Australia, New Zealand, Kenya and British West Indies are required to submit a satisfactory TOEFL score of at least 550 (some departments may require higher scores) before any offer of admission is made. TOEFL may be waived if the applicant has already passed the GCE "A" level English examination with a standing of at least "B".

Interdisciplinary Studies

Numerous interdisciplinary programs are available through the Faculty's various Centres, Institutes and coordinating committees. The Faculty also encourages individual interdisciplinary programs at the Master's, and particularly at the Doctoral level. (See index under Interdisciplinary Studies.)

Graduate Student Status

- 1) **Full-Time Graduate Student** — A full-time graduate student is one in pursuit of a graduate degree devoting full time to his or her academic program. This means that the student may not commit more than 12 hours a week, on the average, of working time, including teaching assistant or research assistant duties, to matters other than the degree program.

The full-time graduate student will be geographically available to the campus, visit it regularly, and make regular use of the University's resources.

Under special circumstances a full-time student may be required to conduct research at some location away from this campus. With the permission of the Dean of Graduate Studies, up to a year of this research time may be counted as residence.

A doctoral student whose residence requirement is twelve consecutive months on campus (see B. Program of Study above) will be considered as being full-time until the special requirements of the program are satisfied.

2) **Part-Time Graduate Student** — Part-time graduate students do not devote full time to their academic programs. This means that more than 12 hours of working time are committed to matters other than the degree program. The time that a student is registered as part-time cannot be applied to the residence requirements of a degree program.

3) **Academic Standing and Readmission** — A student in any graduate program who is required to withdraw will not normally be eligible to apply for readmission to The University of British Columbia for at least one year. After one year, students who have been required to withdraw from a graduate program may be admitted to a different program in the Faculty of Graduate Studies provided they meet all the admissions requirements in effect for that program at the time they apply. Such applications must be accompanied by a statement from the department which recommended withdrawal outlining the reasons for which the student was required to withdraw.

Students who have been required to withdraw from a graduate program may also apply to be readmitted to the same program after at least one year has passed from the effective date of withdrawal. Compelling evidence must be presented that a more successful outcome is likely if the student is readmitted.

All cases for readmission must be reviewed and approved by the Dean of Graduate Studies. Students required to withdraw from a graduate program more than once are not eligible to be considered for admission to any program in the Faculty of Graduate Studies.

4) **On-leave Status** — On-leave status may be granted with permission of the Dean of Graduate Studies to graduate students who find it necessary to interrupt their graduate studies. Leave of absence, not including parental leave, for Master's or Doctoral students, is limited to one year.

A graduate student who is bearing a child or who has primary responsibility for the care of an infant or young child immediately following a birth or adoption of a child is eligible for parental leave. Request should be made through the student's Department for a minimum leave of four months to a maximum of twelve months.

It is understood that students on leave will not be undertaking any academic or research work or using any of this University's facilities during the period of leave and will renew registration to work on their graduate program immediately following leave. The time so spent will not be counted as part of the limited time period allowed for completion of the degree program. Graduate students on leave continue to be registered and must pay a reduced fee for the leave period.

5) **Faculty as Graduate Students** — The Faculty of Graduate Studies does not normally accept, as graduate students seeking an advanced degree at this University, members of the full-time teaching staff of The University of British Columbia. In exceptional circumstances, however, a faculty member may, with the approval of the Dean of the Faculty in which the teaching appointment is held, the Dean of the Faculty of Graduate Studies, and the President, be admitted to a graduate program in some department or school completely separate from the one in which the teaching appointment is held. Doctoral students accepted under these provisions will be required to take leave of absence from their teaching positions until Admitted to Candidacy.

Registration

- 1) All students admitted to the Faculty of Graduate Studies must register when they begin their studies.
- 2) All Doctoral and Master's degree candidates must maintain continuous registration throughout all years until graduation by keeping up with fee payments.

Financial Assistance

The various types of financial assistance available to graduate students at the University of British Columbia are described in the supplement, *Awards and Financial Aid*, available from: Awards and Financial Aid, The University of British Columbia, 1036-1874 East Mall, Vancouver, B.C., Canada, V6T 1Z1.

Requests for further information on financial support should be directed to the specific department in which the student intends to study.

Universities Graduate Exchange Agreements

Graduate students in good standing from UBC or any of the following Universities can take courses at each other's university without having to pay extra tuition fees at the host university under the terms of the Western Graduate Deans' Agreement and the UBC/McGill/Toronto Exchange Agreement:

McGill University
Simon Fraser University
University of Northern British Columbia
University of Alberta
University of Calgary
University of Lethbridge
University of Manitoba
University of Regina
University of Saskatchewan
University of Toronto
University of Victoria

Under the terms of the agreement, no tuition fees are charged by the host university provided the student is currently registered and paying fees at the home institution. (Note: Such students are exempted from tuition fees but are still subject to the assessment of student society fees.)

Authorization forms are available on request from the Office of the Dean, Faculty of Graduate Studies.

Research Services

All matters concerning the administration of research grants and contracts are handled by the Office of Research Services to which enquiries concerning research policies and procedures should be directed. Students do not normally have occasion to deal with matters of research administration, but they are included in the University Patent and Licensing Plan which provides that, if a student "proposes to patent or license an invention or discovery and University facilities or funds administered by the

University were used in making the invention or discovery", then "a disclosure must be made to the University and the rights assigned to the University in return for a share of any proceeds arising from the invention or discovery". Details of the Plan are available from the Office of Research Services.

Students whose research falls within the UBC definition of Research Involving Human Subjects must receive prior approval from the appropriate Screening Committee for Research Involving Human Subjects. Research Services may be consulted for further details.

Animal Care

All graduate students whose research work will involve animals are expected to take a course on Principles and Ethics of Animal Care. The course involves lectures, demonstration sessions and visits to animal care facilities. Upon successful completion of the course, a certificate is issued by the President's Advisory Committee on Animal Care.

Graduate Student Association

All students registered in the Faculty of Graduate Studies are members of the GSA. A subsidiary of the Alma Mater Society, the GSA serves to provide liaison between the Graduate Student Society and the AMS. Thea Koerner House.

Graduate Student Centre (Society)

All students registered in the Faculty of Graduate Studies are members of the Thea Koerner House Graduate Student Centre (Society) known as the Graduate Student Society (GSS). The Society operates from the Thea Koerner House Graduate Student Centre donated to the University by Leon Koerner in 1959 in memory of his late wife, and expanded by graduate students in 1969. The society has for its purpose the promotion of the academic, social, intellectual, cultural and recreational interests of its members. The GSS is a registered Society under the Society Act of British Columbia. Its Council is composed of graduate students elected from each department at the University.

Advanced Technology Management

Assistant Professor and Program Director: M. Tombak.

M.Eng. Degree

This degree is a joint graduate degree offered by the Faculties of Commerce and Business Administration and Applied Science. It is intended for students who wish to continue with graduate study in Applied Science and also provide themselves with advanced management skills which are particularly well suited for high technology companies. In contrast to the M.B.A., this program is specifically designed for Applied Science graduates who wish to become more effective in their chosen technological discipline.

All entrants to the program must hold a Baccalaureate degree in Applied Science and satisfy the minimum requirements of the Faculties of Commerce and Business Administration, Applied Science and Graduate Studies. The program of study is determined by the Program Director in consultation with advisers from the appropriate Faculties, but will include at least the following: 18 credits of specified Commerce prerequisites, exemptions being given on a course-by-course basis; 12 credits of graduate-level Applied Science; 12 credits of graduate-level Commerce. A summer internship, colloquium participation, and a major essay are required.

M.Sc. Degree

This degree is a joint graduate degree supported by the Faculties of Commerce and Business Administration and Science. It is intended for students who wish to continue with graduate study in Science and also provide themselves with advanced management skills which are particularly well suited for high technology companies. In contrast to the M.B.A., this program is specifically intended for Science graduates who wish to become more effective in their chosen technological discipline.

All entrants to the program must hold an Honours Baccalaureate or a Master's degree in Science and satisfy the minimum requirements of the Faculties of Commerce and Business Administration, and Graduate Studies. With the approval of the Faculty of Science, any applicant who has acquired professional research experience equivalent to an Honours Baccalaureate degree in Science may be deemed to have satisfied the Science entrance requirement.

The program of study is determined by the Program Director in consultation with advisers from the appropriate Faculties but will include at least the following: 18 credits of specified Commerce prerequisites, exemptions being given on a course-by-course basis; 12 credits of graduate-level Science; 12 credits of graduate-level Commerce. A summer internship, colloquium participation, and a major essay are required.

Agricultural Economics

Head: G. Kennedy.

Professor: G. C. Van Kooten.

Associate Professors: R. Barichello, G. Kennedy.

Assistant Professors: M. Bohman, J. Vercammen, J. Wohl.

Prerequisites for M.Sc.: Graduation with a B.Sc. (Agr.), B.A. (Economics), or a degree from another related discipline.

Students interested in the Ph.D. degree may register in the Faculty of Graduate Studies through the Department of Economics where their program of study and thesis will

be supervised jointly by members of the Department of Economics and the Department of Agricultural Economics. Applications should be made to the Department of Agricultural Economics.

Agricultural Extension

M.Sc. Degree

Prerequisites: Graduation from the B.Sc. (Agr.) degree program of The University of British Columbia or equivalent, fulfilling the requirements for admission to the Faculty of Graduate Studies, together with satisfactory agricultural extension experience.

The M.Sc. in Agricultural Extension is a joint program between Adult Education in the Faculty of Education and the Faculty of Agricultural Sciences. Minimum program requirements include a six-credit thesis plus 12 credits of course work chosen from Agricultural Sciences and 12 credits of course work chosen from Adult Education 412, 514, 515, 518, 519. Additional course work may be required as preparation for the thesis research project. Students are normally admitted to the program through one of the departments in the Faculty of Agricultural Sciences. Applications to the program must be reviewed and approved by faculty members from both cooperating academic units (Agricultural Sciences and Adult Education) and theses are normally supervised by a faculty committee representing both units. The program may be completed on a part-time or full-time basis. Further information may be obtained from the Office of the Associate Dean, Faculty of Agricultural Sciences or from the office of the Coordinator, Adult Education.

Anatomy

Professor and Head: B. H. Bressler.

Professors: J. T. Emerman, M. J. Hollenberg, W. K. Ovalle,

V. Palaty, C. E. Stonecker, M. E. Todd, W. Vogl, W. A. Webber, J. Weinberg.

Associate Professor: B. J. Crawford.

Assistant Professor: J. Church, T. P. O'Connor, C. D. Roskelley.

Ph.D. and M.Sc. Degrees

The Department offers opportunities and facilities for advanced studies in Anatomy and Cellular Biology leading toward the M.Sc. and Ph.D. degrees. Members of the Department teach and undertake research programs in a wide range of basic and clinically relevant areas. Special research areas include cell and developmental biology, neurobiology, oncology, immunology, muscular dystrophy, muscle and membrane biophysics, regeneration, hypertension and morphological aspects of cell structure and function at the light and electron microscopic levels.

The Department is well equipped and has, for example, the following: scanning and transmission electron microscopes, fluorescence and photo-microscopes, confocal microscope, video image analysis, freeze-fracturing equipment, ultramicrotomes, molecular biology equipment, tissue culture facilities, spectro-photometric and radio-isotope equipment, electrophysiological instrumentation, laser diffraction equipment and ultracentrifuges.

Detailed information on M.Sc. and Ph.D. programs and pertinent course offerings is available on request from the Department.

Prerequisite: B.Sc. degree in Life Sciences, Chemistry, Physics, or equivalent, M.D., D.V.M., or D.D.S. degree or equivalent.

Animal Science

Professor and Head: J. R. Thompson.

Professors: R. M. Beames, R. Blair, B. E. March (Part-time).

Associate Professors: K. M. Cheng, G. K. Iwama, R. G. Peterson,

R. Rajamahendran, D. M. Shackleton, J. A. Shelford, R. M. Tait.

Ph.D. and M.Sc. Degrees

The Department of Animal Science offers opportunities for advanced study and research leading to the M.Sc. and Ph.D. degrees in the areas of physiology, nutrition, biochemistry, behaviour, genetics and management of livestock, poultry, fish, and wildlife. The support staff and laboratory facilities in the Department enable students to develop experimental approaches, ranging from molecular to whole animal levels. The Department supports approximately 55 graduate students.

On-campus facilities include laboratories, both in the MacMillan Building and in the National Centres of Excellence Building, as well as production-scale units for dairy cattle, poultry, sheep, fish, and quail. The UBC Quail Genetic Resource Centre provides unique strains of quail for metabolic and genetics research. Off-campus research facilities available to students include the University Research Farm at Oyster River, the UBC San Rafael Research Aviary in Surrey, and field research facilities for studies of livestock and wildlife productivity. Students may become involved in research programs involving collaboration with researchers in other university departments, Agriculture and Agri-Food Canada, Canada Department of Fisheries and Oceans and various provincial government agencies.

Graduate training in the Department of Animal Science normally involves a combination of courses in both basic and applied sciences, with experiments leading to the completion of a research thesis. Students are expected to publish their research results in leading refereed journals in their discipline.

Information regarding faculty research interests and sources of financial support including scholarships from the Natural Sciences and Engineering Research Council, Science Council of British Columbia, University Graduate Fellowships, the Commonwealth Scholarship Plan, CIDA, IDRC, and a number of private foundations may be obtained by contacting the departmental graduate coordinator. Research grants to faculty members may also be used to support outstanding students.

Prerequisites: a Bachelor's degree with high academic standing in courses in fields of study accepted by the Department. Students with Bachelor's degrees from other disciplines may be required to take additional courses in approved areas of Animal Science during their M.Sc. program.

Outstanding students in the M.Sc. program with first class standing in graduate course work and clear evidence of creative research abilities may be recommended for transfer directly to the Ph.D. program.

Anthropology

Professor and Head (Anthropology and Sociology):

R. Pearson.

Professors: M. M. Ames, R. G. Matson, R. Ridington,

M. G. Silverman, E. Whittaker.

Associate Professors: B. Alfred, J. Barker, M. Blake,

J. Cruikshank, M. Halpin, J. E. M. Kew, B. Muratorio,

D. L. Pokotylo, J. V. Powell.

Assistant Professors: M. Creighton, L. Jackson, W. McKellin, B. Miller.

(See also Sociology listing)

Ph.D. and M.A. Degrees

Advanced study in Anthropology is offered in the Department of Anthropology and Sociology. Area interests include North America, the Pacific Rim, South, Southeast and East Asia, Mesoamerica, South America, Oceania and Europe. The main fields of Socio-Cultural Anthropology (including aesthetic anthropology, cultural ecology, symbolic and linguistic anthropology, contemporary theory and applied anthropology), Anthropological Archaeology and Museum Studies are strongly represented. The Department provides training in qualitative, quantitative, archaeological and museum methods. Research facilities are available in the Museum of Anthropology, and in the Archaeology, Social Survey and Small Groups laboratories. The University Library has good collections to support departmental interests, as well as a large collection of microfilm theses, and the Human Relations Area Files. The Department has access to computer resources to support quantitative and qualitative research. Inter-disciplinary contacts are encouraged, and links are maintained with such programs as Asian Studies (which has major library collections), Linguistics, History, Comparative Literature and Geography.

Information is available from the Department's Admissions Officer in Anthropology about qualifications for admissions to the M.A. and Ph.D. programs and about course requirements, examinations, and other details of the program.

Applied Ethics, Centre for

Professor and Director: M. McDonald, Maurice Young Chair of Applied Ethics.

Senior Research Fellow: P. Danielson (Associate Professor).

Coordinating Committee Members: D. Donaldson (Economics), A. Eisenberg (Political Science), M. Klawe (Computer Science), P. Rodney (Nursing), V. Sweeney (Medicine/Health Care Ethics), G. Walter (Commerce and Business Administration), E. Winkler (Philosophy), P. Danielson (Philosophy).

The Centre for Applied Ethics is an interdisciplinary unit in the Faculty of Graduate Studies. The Centre promotes research and graduate education in applied ethics, including bioethics, business ethics, professional ethics, environmental ethics, and the ethics of information technology. The Centre has three endowed chairs. Each year, through the Maurice Young Visiting Lectureships, the Centre hosts a number of distinguished visiting professors for extended periods of research. In addition, the Centre sponsors lectures, conferences, and workshops. The Centre is supported by endowments, core university funding and project funding.

Students can become associated with the Centre through the Interdisciplinary Studies Program or through participating graduate programs such as the Applied Ethics Stream in Philosophy. The Centre also provides a number of research assistantships each year.

Applied Mathematics, Institute of

Professor and Director: U. M. Ascher (Computer Science).

Professors: B. Ahlborn (Physics), R. Blake (Zoology).

G. W. Bluman (Mathematics), C. W. Clark (Mathematics),

F. Granot (Commerce), L. Harrison (Chemistry), U. G. Haussmann (Mathematics), J. Heywood (Mathematics), M. Isaacson (Civil Engineering), D. G. Kirkpatrick (Computer Science), H. Joe (Statistics), D. Ludwig (Mathematics: Zoology), R. M. Miura (Mathematics: Pharmacology and Therapeutics), V. Modi (Mechanical Engineering), D. W. Oldenburg (Geophysics), M. L. Puterman (Commerce), M. Quick (Mechanical Engineering), R. A. Restrepo (Mathematics), M. Salcudean (Mechanical Engineering), B. R. Seymour (Mathematics), B. Shizgal (Chemistry: Astronomy), A. Soudack (Electrical Engineering), J. M. Varah (CICSR and Computer Science).

Associate Professors: R. P. Anstee (Mathematics),

A. B. Dunwoody (Mechanical Engineering), L. Edelstein-Keshet (Mathematics), R. Froese (Mathematics), S. G. Hoffmann (Physics), W. Hsieh (Oceanography), G. Lawrence (Civil Engineering), P. Loewen (Mathematics), G. Schajer (Mechanical Engineering), D. Schluter (Zoology), D. Steyn (Geography).

Assistant Professors: S. Allen (Oceanography), R. Beckie

(Geological Sciences), J. Friedman (Mathematics), S. I. Green (Mechanical Engineering), W. Nagata (Mathematics), D. Pai (Computer Science), T. Salcudean (Electrical Engineering), J.S. Snoeyink (Computer Science), M. Ward (Mathematics), B. Wetton (Mathematics), M. Yedlin (Geophysics and Electrical Engineering).

Degree Programs

The Institute of Applied Mathematics (IAM) promotes interdisciplinary research activities involving applied mathematics. To this end, the Institute organizes colloquia, special seminars, a computing laboratory and visitors' office accommodation, and provides consultative assistance to those who use applied mathematics in their research.

The Institute provides an administrative structure to arrange graduate programs of an interdisciplinary nature for students with an interest in both mathematics and another field. IAM students can register through any department, but must clearly state their intention of following an IAM program. The availability of financial support and the location of a potential supervisor usually determine the student's department. The majority of IAM students are registered in the Mathematics Department.

The Institute designs and oversees interdisciplinary M.Sc. and Ph.D. degree programs for graduate students from different departments on campus interested in graduate work involving applied mathematics. The basic requirements for these programs are sufficiently flexible to accommodate the particular academic background and career objectives of an individual student. Fields of mathematics involved in interdisciplinary programs of graduate studies may be grouped into four areas:

- **Applied Analysis:** Differential and integral equations, asymptotic and perturbation techniques, similarity methods, numerical analysis, linear and nonlinear wave propagation, methods of mathematical physics, applied probability theory.
- **Fluid Dynamics:** Computational fluid dynamics, turbulence, environmental fluid dynamics, dynamic meteorology, cavitation, aerodynamics, numerical ocean modelling, dynamics of coherent structures, fluid-structure interactions.
- **Mathematical Biology:** Animal behaviour, ecology, neurobiology, nonlinear dynamics and chaos, morphogenesis, pattern formation, immunology, neural networks.
- **Optimization:** Mathematical programming, combinatorics, graphs, trees, network flows, game theory, decision theory, search techniques, stochastic processes, queuing, dynamic programming, optimal and stochastic control.

Basic requirements in M.Sc. and Ph.D. programs are outlined below. There may be other requirements depending on the student's academic background and intended area of study.

M.Sc. Programs

There are three options available to an M.Sc. student:

- 1) 18 credits of course work plus a 12-credit M.Sc. thesis.
- 2) 24 credits of course work plus a six-credit M.Sc. thesis.
- 3) 30 credits of course work plus an M.Sc. essay plus an oral examination.

A maximum of six credits of course work may be 300- or 400-level undergraduate courses, and at least six credits of 500-level mathematics is required. At most 15/18/21 of the 18/24/30 credits can be from any one department.

Ph.D. Programs

Normally only a student with an M.Sc. degree is considered for admission to a Ph.D. program. Shortly after the student enters the Ph.D. program, the supervisor, in consultation with the student, will decide on three of the six core areas (Applied Analysis; Numerical Analysis; Optimization and Control; Combinatorial Optimization; Probability and Statistics; An area of Application) which will define the student's Ph.D. breadth requirement. One area should be specified as the student's major field.

To complete this phase of the program, the student will submit a written report documenting the courses taken and their grades, the theses, papers, previous work experience, etc. which, taken together, are intended to fulfill the breadth requirement. The student's major area requires the equivalent of at least nine credits of related course work, with at least six credits at the graduate level. The other core areas require at least six credits of related course work, with at least three credits at the graduate level.

Having satisfied the breadth requirements, the student will continue with research and writing a Ph.D. thesis proposal. Subsequently, the student will take an oral qualifying examination administered by the Ph.D. thesis committee; the purpose of this exam is the defence of the student's thesis proposal and the examination of the candidate on related material in the major core area. The format of this examination may vary in different departments. The thesis proposal must be presented in written form to the thesis committee at least two weeks prior to the examination. The qualifying examination will normally be taken within two years of entering the Ph.D. program.

Admission to IAM

To enter a degree program supervised by the Institute, a student must first be admitted to an academic department which is closely related to the applicant's interests, e.g., Mathematics, Economics, Mechanical Engineering, etc. The student's first year program is planned with an IAM adviser (appointed by the Director). After successful completion of this first-year program, an interdisciplinary committee is appointed to supervise the student's progress toward meeting the degree requirements.

To obtain the necessary application forms and detailed information on the activities of the Institute and on financial aid, students should write to the Director of the Institute of Applied Mathematics. The department to which the student wishes to be admitted should be clearly indicated.

Architecture

Professor and Director: S. Hirshen.
 Professor: R. J. Cole, (Chair, Graduate Program Committee).
 Associate Professors: A. Gruff, P. Patkau, R. B. Walkey,
 W. W. Wood, J. Wojtowicz.
 Assistant Professors: L. Brock, J. A. Gaitanakis, D. Rapanos,
 J. Shack, G. Wagner, D. Weiner.
 Senior Instructor: S. I. Taylor.

M.Arch. Degree

Architecture is one of several professions concerned with the human environment: the architect is educated to understand and participate in the design of the built environment. As an academic discipline, architecture encompasses the fields of humanities, sciences, technology and creative arts. A candidate for admission to the program must have a strong academic record and demonstrate qualifications necessary for creative problem solving. It is essential therefore that all students entering the School of Architecture be academically mature and that they possess an imaginative outlook. Thus the School selects students from a variety of disciplines on which to build architectural understanding and competence. The Master of Architecture is a professional degree designed to meet the requirements for entrance to the profession of architecture.

The M.Arch. program is of three years' duration for students in full-time attendance during Winter Session; students studying on a part-time basis will need more than three years to fulfill degree requirements. Students may be advised to interrupt their academic studies at the end of the first or second year and withdraw for a prescribed period in order to experience conditions in practice or to travel in countries outside Canada.

Students entering the program should demonstrate interest and potential in the broad field of the creative arts and architecture. Prior instruction and experience in the arts, crafts, or other design oriented activities, with emphasis on visual communication in various media, is extremely valuable. Similarly, the selection of university courses covering a broad range of studies in the arts, humanities and social sciences on the one hand, and the physical and applied sciences on the other, offers a desirable breadth and mix of academic experience. In respect of specific degree requirements within various faculties or universities, the School of Architecture considers it desirable that entering students have completed university-level course work in mathematics, English literature and composition, and a survey course in architectural history.

For students seeking general information and guidance in preparation for entry to the School of Architecture, a brochure entitled, Information for Prospective Students is available from the School on request. Prospective students are encouraged to establish contact with the School during their pre-architecture years by arranging for interviews and counselling with faculty, by attendance at public presentations of student work, and by informal contact with students and recent graduates and participation in student-sponsored activities. Candidates for admission will be of two types: (1) those holding a Bachelor's degree from a recognized university who have achieved First Class standing (80% or above) in at least 12 credits of course work and at least an upper Second Class standing (74% or above) in the remainder of the course work in the last two years of undergraduate study, or their equivalent in the case of a student completing the undergraduate program on a part-time basis; (2) in special circumstances,

designers who demonstrate advanced artistic achievement and would benefit from the program. Applicants must demonstrate aptitude for the study of architecture and creative potential.

Application for admission must be made through the School on appropriate forms (available from the School office). Some applicants who meet entrance requirements may not be accepted because of limitations in the number of available places. All admissions must be approved by the Faculty of Graduate Studies. Full details of the application requirements are available from the School. The submission deadline for application to the School is February 15.

All applicants to the School should note that a Workshop Course is mandatory for entering students. This workshop course is an integral part of the design program in First Year. It is normally of two weeks duration and commences about mid-August. Dates and other particulars concerning the Workshop Course are normally provided with the letter of acceptance. Students who are unable to attend the complete Workshop Course, or who fail to remit the course fee by the prescribed time, will have their admission cancelled. A workshop fee of \$450 is payable within two weeks of the date of an applicant's acceptance of admission. After this time, no refund is possible.

Students accepted for admission to the School who subsequently find that they are unable to attend must re-apply for admission at a later date. A student whose application is rejected may seek the advice of the School before submitting a new application. The advice may include pursuit of academic studies or of specific kinds of experience.

M.A.S.A. Degree

The School of Architecture offers a post-professional graduate program leading to the degree, Master of Advanced Studies in Architecture.

This degree is designed for those who have a professional degree in architecture and have some experience in architectural practice. All candidates are advised that particular aptitudes and experience will be required for this program, and admission will be based on faculty judgement of qualifications over and above the general admission requirements of the Faculty of Graduate Studies. The program is post-professional and therefore is not intended to fulfil the requirements for certification by the RAIC Certification Board as a step toward licensing as an architect in British Columbia or the other provinces in Canada.

Course of Study

This program will allow the student to investigate an area of knowledge within the broad field of architecture in collaboration with one or more members of the faculty interested in that area and engaged in on-going developmental research, or consulting activity in that area. The Research Project is expected to draw together and synthesize existing knowledge in architecture and related fields to produce a clarification or new understanding in the field. The synthesis may result in a design development and report or a written thesis.

Entering students will be required to work out a course of study with an adviser for approval by the Graduate Program Committee. The program must prepare them for work in the chosen thesis area and fill in gaps in areas of knowledge relevant to the thesis topic. In some cases makeup courses will be required beyond the total number of credits of coursework prescribed for the degree.

In order to fulfil the requirements for the degree of Master of Advanced Studies in Architecture, the student must complete a minimum total of 30 credits. Full-time students are required to spend two terms of full-time attendance in the program. Part-time study, as defined in this section of the *Calendar*, is allowed and encouraged, but only with the approval of the Graduate Program Committee of the School of Architecture.

Full-time students normally complete this program within two academic years. No longer than five years may elapse between first registration and satisfactory completion of the entire program, including the thesis.

First Year

- Architecture 580 (0) Graduate Seminar; and
- 18 credits of courses selected in consultation with the student's adviser, including a minimum of 12 credits from courses at the 500 level offered by the School of Architecture and other departments, some of which must be related to the student's research interests; three credits of courses should be in Research Methods if the student's background is deficient in this area; and
- Architecture 599 (12 credits) Thesis for the M.A.S.A. degree.

Areas of Study

Research activities and thesis development will be focussed within five areas of study, as follows:

- building systems, technology and environmental controls
- design research for special populations (e.g. children, the elderly)
- architectural history, theory and criticism
- housing, urban design and development
- computer applications

The thesis may take the form of research or an innovative design project, or a combination of both these forms. A thesis defence is required.

Archival Studies

School of Library, Archival and Information Studies

Professor and Director: K. Haycock.
 Associate Professor and Chair of the Program: T. M. Eastwood.
 Associate Professors: C. Dollar, I. Duranti.

M.A.S. Degree

The Master of Archival Studies program is a professional degree program, open to those holding a bachelor's degree considered suitable by the Admissions Committee and which meets the minimum admissions requirements of the Faculty of Graduate Studies. Archival work is related to that of many other disciplines, including history, political science, business administration, and sociology. The program is unique in North America as the only separate graduate degree program in the field. Graduates obtain positions as archivists and records managers across Canada in businesses, government agencies, religious bodies, and institutions; some engage in freelance work.

The program comprises 48 credits including an optional thesis and an optional internship. Students must begin the program in September of a year and normally cannot complete it before April of the second year following. The full-time Core of required courses occupies the first Winter Session. The internship, if taken, can be expected to occupy much of a summer. University, public, and other archives within easy reach provide models of archival practice. The application of archival theory is also demonstrated through field trips in courses.

Asian Research, Institute of

Professor and Director: W. M. Fruin (also History, Commerce and Business Administration).

Advisory Council: W. M. Fruin (Chair), Y. Chang, G. Hainsworth, N. Halpern, G. Johnson, T. G. McGee, K. Nagatani, M. Nakamura, K. A. Park, I. Vertinsky, J. Wood.
Professors: N. Halpern, T. G. McGee, M. Nakamura, K. A. Park, I. Vertinsky.

Honorary Professors: L. Cha, P. Lin, B. Morrison, E. Wickberg.

The Institute of Asian Research, located in the Asian Centre at UBC, was originally established in 1978 to sponsor and coordinate research activities concerning Asia and the Pacific. While not directly involved in classroom teaching, the Institute provided liaison for seminar presentations and special lectures by Asian area specialists working at or visiting UBC.

In 1992, the Institute was restructured to include five area research centres: the Centres for Chinese, Japanese, Korean, South Asian and South East Asian Research. The Centres serve as focal points on campus for research and community outreach activities on their specific areas of the Asia Pacific region. The aim of the Institute and its Centres is to facilitate interaction among people from different disciplines and backgrounds, from both campus and community, who share a common interest in Asia and the Pacific. To this end the Institute and its constituent Centres organize seminars, lectures workshops, conferences, art exhibits, and cultural performances. A series of working papers and monographs as well as the Asia Pacific Report, a bi-annual newsletter focusing on current activities relating to Asia on campus and in the community, are also published.

The main objective of the restructuring was to promote and develop high quality research on the Asia Pacific region and its relations with Canada with particular emphasis on the policy implications of research undertaken. Research activities of the Institute are interdisciplinary, interregional and long range. They cover many areas of intellectual inquiry encompassing general processes of cultural, economic, political, social and technical change in the Asia Pacific region. The Institute is in the process of hiring ten endowed research chairs to carry out its research activities in these areas. The Institute also acts as host for Honorary Research Associates and Visiting Scholars who participate actively in the Institute's and Centres' programs. In addition, the Institute has launched an International Associates Forum to promote mutual understanding between Canada and the Asia Pacific countries through long-term visits of government officials, corporate personnel and academic researchers from the region to UBC.

To receive regular notification of Centre- and Institute-sponsored events, individuals are encouraged to join the Centre of their choice or the Friends of the Asian Centre for a newsletter subscription. The Institute of Asian Research is located at The Asian Centre, 1871 West Mall, The University of British Columbia, Vancouver, B.C. V6T 1Z2, Canada; telephone (604) 822-4688, fax (604) 822-5207.

Asian Studies

Professor and Head: M. S. Duke.

Professors: A. N. Akhujar, D. L. Overmyer, J. D. Schmidt, K. Takashima, K. Tsuruta.

Associate Professors: K. E. Bryant, T. Hellwig, H. Oberoi.

Assistant Professors: D. Baker, Y. Collier-Sanuki, R. Goldman, N. L. Hur, R. King, J. Mostow, L. Preston, C. Swatek.

Instructors: J. Chiu-Duke, K. H. Lynn.

Ph.D. and M.A. Degrees

There are good facilities for advanced work in various fields of Asian Studies. The purchase in 1959 of the P'u-p'an collection gave The University of British Columbia one of the major Chinese libraries in North America. Subsequent purchases have served to consolidate this position. A good foundation for the Japanese collection was laid by the acquisition of books from the libraries of the late E. H. Norman and G. B. Sansom and by the purchase of a Tokugawa map collection. The university library is also a depository for Japanese Government Publications. The library's holdings now exceed 377,000 volumes in East Asian Languages in addition to substantial holdings in western languages and micro-form. The library also has a growing collection related to South Asia and the founding in 1968 of the Shastri Indo-Canadian Institute, in which the university is a founder-member and major participant, is greatly assisting this development. It is estimated that the present extent of the collection in Indic languages such as Hindi, Urdu, Punjabi, Sanskrit, Prakrit, Bengali, Marathi and Tamil is 44,000 volumes. In addition, there are publications bearing on South Asian studies in micro-form and in Western languages. The library is now building its collection of Indonesian and Korean materials.

The Department offers the degrees of Ph.D. and M.A. in Chinese, Japanese and South Asian languages, in the fields of language, literature, and pre-modern history, religion and thought. It also provides language training for those doing graduate work relating to China, Japan, and South Asia in other departments. Those interested in graduate studies relating to Asia in fields such as modern history, political science, economics, geography, anthropology, fine arts, should apply to the departments concerned.

Admission to the M.A. program in Asian Studies normally requires a B.A. degree with first-class standing in Chinese, Japanese or South Asian languages. This implies four years of language study. The Department is prepared to accept a limited number of students who are otherwise well-qualified and show linguistic aptitude but have less than this amount of preparation in language. Such students will be required to spend one or two extra years in their M.A. program making up this deficiency.

Admission to the Ph.D. program in Asian Studies normally requires an M.A. in Asian Studies or its equivalent. Candidates for the Ph.D. must have before admittance an adequate command of Chinese, Japanese, Hindi/Urdu, Punjabi, Sanskrit, Korean or Indonesian. In the case of Chinese, this will normally mean a competent reading knowledge of both modern and classical forms of the language.

Astronomy

See Geophysics and Astronomy.

Atmospheric Science

Associate Professor and Chair: D. G. Steyn (Geography).

M.Sc. Degree

A program leading to a M.Sc. degree is offered under the joint sponsorship of the Departments of Geography and Oceanography. Students must satisfy the admission requirements of the Faculty of Graduate Studies and normally have a Bachelor's degree in atmospheric science, physics, chemistry, mathematics, physical geography or

applied science. The M.Sc. program consists of 12 credits of thesis and 18 credits of course work, or 30 credits of course work and an essay. It may be obtained through full or part-time study.

Atmospheric science deals with understanding the processes of the atmosphere and the resulting weather and climate. Many important environmental issues are related to the atmosphere. The Atmospheric Science Program offers training in the basic processes of the atmosphere and the application of scientific knowledge to problems such as atmospheric models for weather and climate prediction, air pollution studies and other environmental areas.

The faculty engage in fundamental research in atmospheric science, both independently and in cooperation with federal and provincial laboratories and other research groups around the world. The emphasis of the research is on studies of processes and developing physical understanding of the atmosphere. The research commonly involves field or laboratory measurement and observation; data analysis and interpretation; and numerical model construction, modification and validation. The group is extremely well equipped for research on most characteristics of the atmospheric boundary layer. In addition to conventional meteorological instruments, there are systems for sensing all component fluxes of the radiation and energy budgets, eddy correlation systems for turbulent heat fluxes and other facilities for probing boundary layer structure. Equipment for digital recording and analysis of data and images is available. Other facilities include access to a NOAA satellite receiving station and image processing laboratory and weather workstations in the Geography Department connected to the Pacific Weather Centre's satellite and synoptic data systems.

Students wishing to undertake a Ph.D. degree program in the Atmospheric Sciences may do so through the Departments of Geography or Oceanography and should consult the department most appropriate to the proposed field of specialization.

Further information can be obtained by contacting the Chair of the Atmospheric Science Program.

Audiology and Speech Sciences

Professor and Director: J. R. Johnston.

Professors: A.-P. Benguerel, J. H. V. Gilbert, D. D. Greenwood.
Assistant Professors: B. M. Bernhardt, C. E. Johnson.

M. K. Pichora-Fuller.

Senior Instructors: N. Lamb, E. D. MacLeod.

Instructor: C. B. Bruce.

Clinical Associate Professor: B. A. Purves.

Ph.D. and M.Sc. Degrees

The School of Audiology and Speech Sciences offers a post-graduate program leading to a Master of Science degree. This program is primarily designed to provide the scientific and clinical education necessary for the professions of Audiology and Speech-Language Pathology. These professional fields require a thorough understanding of human communication and its disorders. The M.Sc. degree program thus builds upon background studies in linguistics, psychology, acoustics, physiology and other related disciplines, and incorporates both basic and applied science. After completing basic level courses, students pursue advanced work in a professional specialty, i.e., either audiology or speech-language pathology. Supervised clinical externships are provided in hospitals,

schools, rehabilitation centres, and other service settings throughout the Province. Graduates of the clinical education program will have completed the academic and practical requirements for professional certification. This program will usually require 24 to 36 months to complete, depending upon the student's academic preparation.

The School also offers a program leading to a Ph.D. degree with specialization in one of the following areas: experimental phonetics, neurolinguistics/linguistic aphasiology, developmental phonetics and phonology, language acquisition, developmental language disorders, discourse analysis, phonological and phonetic disorders, speech understanding in the elderly, aural rehabilitation and hearing science. A brochure giving details of this program is available from the School's office.

See entry under Audiology and Speech Sciences for a more detailed description of the School's philosophy, curriculum and application procedures. Note that students accepting an offer of admission to the M.Sc. program in the School of Audiology and Speech Sciences, at the time of acceptance of admission are required to pay a non-refundable deposit of \$200, to be applied towards the student's first-term tuition.

B.C. Studies

A Quarterly Journal of the Humanities and Social Sciences.

Editor: A. Smith (History)

This award-winning quarterly publishes the results of research pertaining to the province covering a wide range of interests such as history, anthropology, sociology, politics, and geography. Each issue contains a book review section and a comprehensive bibliography of recently published material relating to British Columbia.

Biochemistry and Molecular Biology

Professor and Head: George A. Mackie.

Professors: C. R. Astell, P. D. Bragg, G. D. Brayer,

E. P. M. Candido, P. R. Cullis, P. P. Dennis,

R. T. A. MacGillivray, A. G. Mauk, R. S. Molday, M. Smith.

Associate Professors: R. W. Brownsey, I. Clark-Lewis,

B. B. Finlay.

Assistant Professors: L. P. McIntosh, M. Roberge, I. J. Sadowski.

Senior Instructors: R. E. Barton, B. E. Tiberis, E. M. Trip.

Facilities are available for original investigations in many fields of biochemistry.

Ph.D. Degree

The areas of research possible within the department are: Chromatin structure. Organization of eukaryotic chromosomal DNA. Analysis of the genomes of viruses and yeast. Control of gene expression in eucaryotes, eubacteria and archaeobacteria. Structure and function of genes using specific mutagenesis. Structure, organization and expression of genes coding for the clotting factors. Interleukins. The mechanism of the action of insulin. Membrane structure and function. Cell surface receptors, signal transduction, and cell growth control. Neural and retinal photoreceptor membranes. Bacterial and mitochondrial bioenergetics. Active transport. Lipid based targeted delivery systems. Macromolecular crystallography and X-ray diffraction techniques for the characterization of enzymes and protein complexes. Metalloprotein structure and function. Mechanism of hemoprotein electron transfer. Structural analysis of proteins by nuclear magnetic resonance.

Major instrumentation in the department includes X-ray diffraction equipment for macromolecular crystallography, computer graphics equipment, a scanning and transmission electron microscope, EPR spectrometer, CD and MCD equipment, a microprocessor-controlled spectrofluorometer with polarization accessories, double beam/dual wavelength spectrophotometers with stop-flow and low temperature accessories, freeze fracture apparatus, 500 and 200-MHZ NMR spectrometers, phosphorimager, and cell culture facilities.

Candidates must hold an Honours degree in Biochemistry with high standing or 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: Candidates with diverse backgrounds can be accepted providing they have graduated with high standing from university programs giving a strong background in science. The M.Sc. program includes Biochemistry 303 and 301 if not already taken; a thesis (12 credits); and courses approved by the department in Biochemistry and related fields (18 credits). Biochemistry 303 and 301, or the equivalent, are prerequisites to all graduate courses in Biochemistry and Molecular Biology.

For more information contact Biochemistry and Molecular Biology, Faculty of Medicine, The University of British Columbia, 2146 Health Sciences Mall, Vancouver, B.C., V6T 1Z3, Canada; telephone (604) 822-3178, fax (604) 822-5227.

Biology, Interdisciplinary Program in

Chair, Advisory Committee: A. G. Lewis (Oceanography).

Ph.D. and M.Sc. Degrees

The field of Biology is not treated by a single department. Rather, opportunities for graduate work in most areas of Biology exist in the specialized Life Science departments. The interdisciplinary graduate program in Biology is designed specifically for those students whose thesis research is primarily biological but requires major input from more than one department. Therefore, to qualify for the Program, the student must propose a plan for graduate thesis research that will have a major interdisciplinary component.

As background, an undergraduate degree in the Life Sciences is preferable but not essential.

At least one member of the candidate's supervisory committee must be from an appropriate department different from that in which the candidate is enrolled.

Students wishing to pursue an interdisciplinary graduate program in Biology should consult the department or departments most appropriate to their field of specialization, and the chair of the Advisory Committee for the Interdisciplinary Graduate Program in Biology.

Biomedical Engineering

Research in Biomedical Engineering is carried out in the Departments of Chemical, Electrical, Mechanical Engineering and Physics in association with the Faculty of Medicine and the affiliated teaching hospitals.

Bio-Resource Engineering

Associate Professor and Acting Head: S.-T. Chieng

Professor: K. V. Lo

Assistant Professors: A. K. P. Lau, R. J. Petrell.

M.A.Sc. and M.Sc. Degrees

The Master of Applied Science is offered for qualified engineering graduates. Prerequisite: graduation in Bio-Resource Engineering or other branches of engineering. The M.Sc. is offered for qualified graduates from Agricultural Sciences, Forestry and Science. Prerequisite: graduation from one of these faculties and approval of their course by the head of the department. Ph.D. programs can be arranged for suitable candidates in conjunction with other engineering departments and interdisciplinary committees.

The Department carries out studies in Water Quality and Hydrology; Irrigation and Drainage Engineering; Environmental Control; Aquacultural Engineering, Physical, Rheological and Thermal Properties of Biological Materials; Food Process Engineering; Biotechnology and Biomass Conversions for Waste Treatment and Utilization; and design of Horticultural operations.

The course includes 12 credits in the Department of Bio-Resource Engineering of which at least six credits must be courses numbered 500 or above.

Part-time students may enrol in the M.A.Sc. and M.Sc. degree programs.

Botany

Professor and Head: I. E. P. Taylor.

Professors: B. A. Bohm, T. Cavalier-Smith, R. E. De Wreede,

F. R. Ganders, A. D. M. Glass, B. R. Green, P. J. Harrison,

G. C. Hughes, J. R. Maze, F. J. R. Taylor, G. H. N. Towers,

R. A. Turkington.

Associate Professors: C. Douglas, R. E. Foreman, P. G. Harrison,

G. Haughn, L. Oliveira.

Assistant Professors: M. Berbee, G. E. Bradfield, N. L. Glass,

L. Kunst.

Associate Members: S. Berch, R. Guy, L. G. Harrison, K. Klinka,

H. Sanfacon, G. Straley, N. J. Turner.

Ph.D and M.Sc. Degrees

Research underway in the Department of Botany extends from molecular genetics, biochemistry and physiology of plants (including fungi) through cytology, plant development, morphology and systematics to ecology and phytogeography. Such a broad spectrum of activities provides for dynamic interactions between subdisciplines. In addition, opportunities for interdisciplinary research projects exist with colleagues in other departments and faculties on campus, such as Forest Science, Plant Science, Zoology, Chemistry, Microbiology, Soil Science and Physics.

Although basic science is our primary mandate, several of our faculty apply their strengths in the basic sciences to applied problems such as algal culture, tissue culture, forest regeneration and hydroponics.

The Botany Department has most of the major types of equipment used in laboratory and field research in Botany. Of particular note are the large number of controlled environment rooms and chambers, the electron microscopy facility (with transmission, image processing, scanning and x-ray analysis electron microscopes), ultracentrifuges, spectrophotometers, scintillation counters, and equipment for gas-liquid chromatography,

high pressure liquid chromatography, gas chromatography-mass spectrometry, atomic absorption spectrometry, and nuclear magnetic resonance spectroscopy.

The Department has a large herbarium with several full-time staff members, housing permanent reference and research collections representing all groups of plants. Over 530,000 specimens are accessioned, including 215,000 specimens of vascular plants, 200,000 specimens of Bryophytes (one of the largest collections in the world), 80,000 specimens of algae, 23,000 specimens of lichens, and 14,000 specimens of fungi. The North East Pacific Culture Collection of Marine Phytoplankton, housed in the Department of Oceanography, is one of the largest in North America and represents a valuable resource for algal physiological and ecological studies. The department also houses nationally registered collections of Fungi and Freshwater algae.

The Department has an experimental field and full greenhouse facilities. Another important botanical research facility is the Botanical Garden. This includes sections devoted to native, alpine and medicinal plants, and an Asian Garden. Bamfield Marine Station, on the west coast of Vancouver Island, is a unique research facility for marine botany, and also provides courses in many kinds of marine studies.

The broad areas of research possible within the department are:

- 1) Cell biology and plant biochemistry
- 2) Genetics, cytogenetics and plant molecular biology
- 3) Plant and algal physiology
- 4) Terrestrial and marine ecology
- 5) Biosystematics and evolution
- 6) Plant development and morphology

Supervision is available for study of most major groups of plants, fungi and protists.

M.Sc. Degree

Prerequisite: a First class or high second class B.Sc.

The M.Sc. program requires a minimum of 30 credits with the thesis counting for 12 credits. Courses may be selected from the Botany Department and a wide range of related departments on campus, in consultation with the research supervisor and the Head of Department. The M.Sc. degree can be taken on a part-time basis and a M.Sc. without thesis is also available.

Ph.D. Degree

Students who are admitted to the M.Sc. program may, subject to the regulations of the Faculty of Graduate Studies, be granted permission to transfer to a Ph.D. program provided a first class performance has been obtained in course work and there is clear evidence of research prowess. Exceptional students may be admitted straight to the Ph.D. program from the bachelors level. Students with an M.Sc. degree apply directly for the Ph.D. program. Although there are no formal course requirements, courses are selected in accordance with the recommendation of the Department and the candidate's Ph.D. committee.

Canadian Literature

Editor: W. H. New (English).

Associate Editors: E.-M. Kröller (English), L. R. Ricou (English).

This quarterly journal features literary criticism on Canada's literature and its relation to society and contains reviews of significant Canadian literary works.

Chemical Engineering

Professor and Head: A. P. Watkinson.

Professors: J. L. Bert, B. D. Bowen, R. M. R. Branion, J. R. Grace,

C. J. Lim, A. Meisen, C. W. Oloman, D. W. Thompson.

Associate Professors: C. Breerton, J. McHaffey, J. Piret, K. Smith.

Assistant Professors: S. Duff, P. Englezos, S.G. Hatzikiriakos,

C. Haynes, E. Kwok.

Honorary Professors: N. Epstein, R. J. Kerekes.

Associate Member: D. Kilburn.

Adjunct Professor: C. Bennington.

Professors Emeriti: J. Lielmezs, K. Pinder.

Ph.D., M.A.Sc. and M.Eng. Degrees

The Department offers facilities for research studies in the following fields:

- 1) Mass, momentum and heat transfer
- 2) Chemical engineering unit operations
- 3) Biochemical and biomedical engineering
- 4) Pollution control studies
- 5) Electrochemical engineering
- 6) Modelling, optimization and control
- 7) Pulp and paper technology
- 8) Energy
- 9) Biotechnology
- 10) Polymer rheology and processing

The Department also operates a joint research program at the M.A.Sc. and Ph.D. levels with the Pulp and Paper Research Institute of Canada and with the UBC Biotechnology Laboratory in areas of common interest.

Part-time students may enrol in the M.A.Sc. and M.Eng. degree programs.

M.A.Sc. Degree

Prerequisite: Graduation in Chemical Engineering. Graduates from other branches of engineering or from science may also be accepted, but may be required to successfully complete selected undergraduate courses in Chemical Engineering before receiving a degree. A list of undergraduate course requirements may be obtained from the department.

Program: Must include Chemical Engineering 598, and at least 18 credits of courses approved by the student's supervisor and the departmental graduate adviser. Normally the required 18 credits will be made up of 12 credits chosen from graduate courses within the Department and six credits of courses outside the Department. The M.A.Sc. thesis counts for an additional 12 credits.

M.Eng. Degree

Offered primarily for candidates who have a minimum of two years work experience after obtaining their bachelor's degrees. Under special circumstances students with less than two years work experience may be accepted.

Prerequisite: As for M.A.Sc. degree.

Program: Must include Chemical Engineering 596 and 598 and 30 additional credits of courses approved by the student's adviser and the departmental graduate adviser. Normally these 30 credits will be made up of 12 credits chosen from graduate courses within the Department, six credits of courses outside the Department and an additional 12 credits chosen from within or outside the Department. At least 24 credits must be at the 500-level.

Ph.D. Degree

Prerequisite: As for M.A.Sc. degree. Normally students will have completed a M.A.Sc. degree before registering for a Ph.D. A brochure listing areas of current research interest is available from the department.

Chemistry

Professor and Head: P. Legzdins.

Professors: F. Aubke, R. J. Anderson, M. Blades, A. Bree,

C. E. Brion, D. E. Brooks, E. E. Burnell, D. P. Chong,

M. B. Comisarow, J. A. R. Coope, W. R. Cullen,

D. H. Dolphin, D. G. Fleming, M. D. Fryzuk, C. A. Fyfe,

M. C. L. Gerry, L. G. Harrison, F. G. Herring, B. R. James,

J. P. Kutney, P. Legzdins, A. J. Merer, K. A. R. Mitchell,

T. Money, E. A. Ogryzlo, G. N. Patey, E. Piers, R. E. Pincock,

J. R. Sams, J. R. Scheffer, B. Shizgal, R. F. Snider, A. Storr,

R. C. Thompson, J. Trotter, D. C. Walker, L. S. Weiler,

S. G. Withers.

Associate Professors: G. S. Bates, L. D. Burnick, C. Orvig.

Assistant Professors: S. M. Bradley, D. Chen, K. Orians,

J. Sherman, M. Tanner, I. Waller.

Ph.D. and M.Sc. Degrees

The Department has many modern research instruments available, among which are: analytical and fully-computerized high resolution mass spectrometers, vacuum ultraviolet, far infrared and Raman spectrographs and spectrometers, stopped-flow spectrophotometer; microwave spectrometers; ORD and circular dichroism apparatus; electron spin and electron double resonance spectrometers; wide-line, spin echo, and high-resolution Fourier transform nuclear magnetic resonance spectrometers; Mossbauer spectrometers; automatic radioactive counters; automatic X-ray diffraction equipment; analytical and preparative gas chromatographs; autoclaves; magnetic balances; high-energy electron accelerator; a Gammacell 220; Q-switched ruby lasers; a helium liquifier; u.v. photoelectron, electron impact and ESCA spectrometers; ion cyclotron resonance spectrometers; preparative ultracentrifuges and cold room facilities; amino acid analysers. The TRIUMF cyclotron is available. Facilities exist for mycochemistry, phytochemistry, and biogenetic studies. There are excellent computer facilities and mechanical, electronics and glassblowing workshops. A microanalytical service is also provided. Research facilities are available for accommodation of over 300 graduate students, postdoctoral fellows and academic staff.

The Department of Chemistry offers a wide variety of research programs leading to the degrees of Master of Science and Doctor of Philosophy in the following fields: Analytical Chemistry, Bio-Inorganic Chemistry, Bio-Organic Chemistry, Bio-Physical Chemistry, Carbohydrate Chemistry, Chemical Applications of the Mossbauer Effect, Chemical Biology, Chemical Kinetics and Reaction Mechanisms, Chemical Physics, Chemistry of Biologically Important Substances, Chemistry of the Solid State, Chemistry of Steroids, Alkaloids and Terpenes, Combustion and Oxidation Processes, Electron Spin Resonance Spectroscopy, Electronic Spectroscopy, Electron Nuclear Double Resonance Spectroscopy, Heterocyclic Chemistry, Homogeneous Catalysis, Infrared and Raman Spectroscopy, Inorganic Fluorine Chemistry, Inorganic Ring Systems, Ion Cyclotron Resonance Spectroscopy, Isotope Exchange Reactions, Kinetic Spectroscopy, Macromolecular Chemistry, Magnetochemistry, Mass Spectrometry, Microwave Spectroscopy, Molecular Beams, Molecular Spectroscopy and Molecular Structure, Non-Aqueous Solution Chemistry, Nuclear Chemistry, Nuclear Magnetic Resonance Spectroscopy, Nuclear Magnetic Resonance Imaging, Nuclear Quadrupole Resonance Spectroscopy, Organic Photochemistry, Organometallic Chemistry, Photochemistry, Photoelectron Spectroscopy, Physical Organic Chemistry, Phytochemistry, Radiation Chemistry, Structural Inorganic Chemistry, Structure, Synthesis and Biogenesis of Fungal Metabolites, Surface

Chemistry and Surface Science including Auger and LEED Spectroscopy, Synthetic Inorganic Chemistry, Synthetic Organic Chemistry, Theoretical Chemistry, X-Ray Diffraction Crystallography.

M.Sc. Degree

Prerequisite: Honours degree in Chemistry or Biochemistry or Physics, or combined Honours in Chemistry and Physics, Chemistry and Mathematics, Chemistry and Biochemistry, Chemistry and Oceanography, 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 the equivalent to any of the above.

Course includes thesis and 18 credits in graduate or advanced courses in Chemistry and related subjects.

Ph.D. Degree

Candidates are required to hold an M.Sc. degree in Chemistry or a B.Sc. degree with high standing in an Honours or combined Honours Chemistry program or equivalent. Students in the M.Sc. program may transfer into the Ph.D. program at the end of their first year provided they meet the transfer requirements of the Faculty of Graduate Studies.

Course work in the Ph.D. program is assigned in accordance with the recommendation of the Department and the candidate's Ph.D. committee.

Chinese Research, Centre for

Executive Committee: G. Johnson, (Anthropology and Sociology, Chair), Y.-T. Hsing (Centre for Human Settlements), D. L. Overmyer (Asian Studies), G. Peterson (History), G. Wong (Commerce and Business Administration).
See Asian Research, Institute of.

Civil Engineering

Professor and Head: M. Isaacson.

Professors: D. L. Anderson, P. M. Byrne, R. G. Campanella, W. D. L. Finn, R. O. Foschi, K. J. F. Hall, D. S. Mavinic, D. M. McClung, S. Mindess, F. P. D. Navin, M. C. Quick, A. D. Russell, S. O. Russell, S. F. Stiemer, Y. P. Vaid.
Associate Professors: J. W. Atwater, N. Banthia, G. R. Brown, W. F. Caselton, E. R. Hall, G. A. Lawrence, R. G. Sexsmith, R. A. Spencer.
Assistant Professors: P. E. Adebbar, R. J. Fannin, T. Froese, H. G. L. Prion, C. E. Ventura.

Ph.D., M.A.Sc., and M.Eng. Degrees

The Department of Civil Engineering at UBC offers three Graduate Degree Programs: Master of Engineering (M.Eng.), Master of Applied Science (M.A.Sc.), and Doctor of Philosophy (Ph.D.). In each of these programs, students may select one of the following areas of specialization:

- Coastal and Ocean Engineering
- Construction Engineering and Management
- Earthquake Engineering
- Environmental Engineering
- Environmental Fluid Mechanics
- Geotechnical Engineering
- Materials (timber, cement and concrete) and Fracture Mechanics
- Structures and Applied Mechanics, Reliability Theory and Probabilistic Methods

- Transportation
- Water Resources, Hydrology and Hydraulics

M.Eng. Degree

This is an advanced professional degree which requires a total of 30 credits of course work and a final comprehensive examination. At least 24 credits in graduate courses are required of which at least 12 must be in Civil Engineering subjects. No thesis is required for this program.

Full-time students can complete the course work requirements for the M.Eng. degree in two terms (first term: September to December; second term: January to April). The comprehensive examination is taken after this and consequently all degree requirements will not be complete in time for Spring graduation in the first year.

M.A.Sc. Degree

This degree requires a minimum of 30 credits made up of at least 18 credits of course work in addition to the research necessary for a Master's thesis. At least 12 credits in graduate courses in Civil Engineering subjects are required.

Full-time students can complete the course work requirements for the M.A.Sc. degree in two terms (first term: September to December; second term: January to April). Students in the M.A.Sc. program spend full time on directed research following completion of their course work requirements and during the summer. It usually takes 18 to 22 months of full-time study to complete the course work and thesis requirements of the M.A.Sc. program.

Ph.D. Degree

This research degree is offered in each of the areas of specialization listed above. The Ph.D. program is based on individual objectives with close supervision and consultation with a faculty adviser. The minimum number of course credits required beyond the Bachelor's degree is 36; however, students generally need about one full year of course work beyond a Master's degree. A Ph.D. dissertation takes another one to three years of full-time research work.

Professional Partnership Program

Students may complete all or part of the work for their graduate degrees in a joint industry-university partnership program. Students spend part of their time working for industry or government and the rest at university, with joint supervision from faculty members and industry representatives. M.Eng. students are required to take the project course CIVL 596, but all other requirements for the degrees remain as outlined above. Details may be obtained from the department office.

Part-time Students

Students may complete either the M.Eng. or the M.A.Sc. degree on a part-time basis; however, part-time students may spread their program over not more than five years.

Persons interested in taking advanced graduate courses, but who do not wish to undertake a full graduate degree program, may register on an unclassified (i.e., non-degree) basis.

Classical Archaeology

M.A. Degree

See Classics.

Classics

Professor and Head: A. A. Barrett.

Professors: J. A. S. Evans, A. J. Podlecki, J. Russell, G. N. Sandy, S. Darcus Sullivan, R. B. Todd, E. H. Williams.
Associate Professors: H. G. Edinger, P. E. Harding.
Assistant Professor: A. S. Dusing.

Ph.D. and M.A. Degrees

The thesis for the M.A. in Classics may be written in one of the following: Greek Language and Literature, Latin Language and Literature, Greek History, Roman History, Greek or Roman Archaeology, or Ancient Philosophy.

Major essays may be written in any of these fields by students following the M.A. program with Comprehensive Examinations. The Comprehensive Examinations may be weighted toward Greek or Latin Studies without concentrating exclusively on either. Satisfactory knowledge of both Latin and Greek is required; separate Masters of Arts degrees in Latin and Greek are not given.

The M.A. in Classical Archaeology is awarded for successful completion of 30 credits of course work, a major essay, and comprehensive examinations. Brochures describing the M.A. and Ph.D. programs are available from the Department of Classics.

Commerce and Business Administration

Dean of the Faculty: M. A. Goldberg.

Associate Dean, Academic Programs: D. R. Atkins
Associate Dean, Faculty Development and Professional Programs: P. J. Frost.

Assistant Dean and Director, International Programs: G. Wong.
Assistant Dean and Director, Masters' and Study Abroad and Exchange Programs: E. Davis.

Assistant Dean and Director, Undergraduate and Study Abroad and Exchange Programs: R. M. Davis.

Director, Ph.D. Program: A. Kraus.

Professors: D. R. Atkins, I. Benbasat, A. E. Boardman, J. A. Brander, S. L. Brumelle, P. de Jong, B. E. Eckbo, G. A. Feltham, J. D. Forbes, P. J. Frost, M. A. Goldberg, G. J. Gorn, D. Granot, F. Granot, N. A. Hall (on leave), T. D. Heaver, R. L. Heinkel, A. Kraus, M. D. Levi, P. A. Lusztig, K. R. MacCrimmon, J. K. Murnighan, T. Oum, C. C. Pinder, R. W. Pollay, M. L. Puterman, M. Queyranne, B. Schwab, B. Spencer, W. T. Stanbury, M. Thompson, I. Vertinsky, D. A. Wehrung, C. B. Weinberg, J. T. Williams, W. T. Ziemba.

Associate Professors: M. E. Ace, R. Amit, B. Bemmels, R. E. Blaine (on leave), H. Chen, G. Chow, J. D. Claxton, A. S. Dexter, M. Frank, M. Gerlach, R. M. Giammarino, R. C. Goldstein, S. W. Hamilton, R. Helsley, L. D. Jones, R. F. Kelly, T. Knight, V. Maksimovic, T. S. McCormick, D. C. McPhillips, I. F. Moore, P. N. Nemetz, T. W. Ross, F. A. Siller, D. A. Simunic, J. W. C. Tomlinson, M. W. Tretheway, D. K. C. Tse, D. H. Uyeno, G. A. Walter, Y. Wand, W. G. Waters, J. Zechner.

Assistant Professors: A. Ansari, J. Begley, J. Berk, I. M. Cockburn, R. G. Donaldson, P. E. Fischer, R. Freedman, K. Head, B. Hollfield, D. Jennings, V. Krishnamurthy, N. Langton, M. M. Margiotta, B. P. M. McCabe, V. T. Naik, J. J. Nelson, S. V. Rao, J. Ries, S. S. Rosenthal, S. Siddarth, C. T. Somerville, W. Strange, M. Tombak, A. Trice, R. Uppal, C. Woo.

Lecturers: S. Alisharan, M. A. Booth, J. de Rooy, B. Graham.

D. B. Lockwood, E. MacKenzie, D. J. Meredith, C. Vertesi.
Senior Instructors: R. M. Davis, D. F. Gardiner.

M.B.A. Degree

It is anticipated that a revised M.B.A. program will be offered in the 1995/96 academic year on a full- and part-

time basis. The program will include an integrated core, specializations, internships, professional development weeks and modular course offerings. For up to date information about the revised program, write to the Masters' Program Office, Faculty of Commerce and Business Administration, The University of British Columbia, 102-2053 Main Mall, Vancouver, B.C., V6T 1Z2, Canada.

The objective of the M.B.A. program is to offer an integrated course of study in Management and Administration and the important cognate disciplines to properly qualified persons holding a Bachelor's degree. Students accepting an offer of admission to the M.B.A. program will be required to pay, at the time of acceptance of the offer of admission, a non-refundable deposit of \$200 to be applied to the student's first-term tuition. Full time students normally spend two academic years in residence. On a part-time basis candidates may spread the course work over a longer period, provided that all degree requirements are completed within five years of initial registration.

In determining the admissibility of a candidate to the M.B.A. program, no distinction is made between full-time and part-time students.

First Year of Full-time Studies

Candidates are required to take the following 33 credits of prerequisite Core Courses in their first year:

COMM 311	Decision Analysis I
COMM 312	Decision Analysis II
COMM 313	Quantitative Methods-Analysis
COMM 323	Human Resources Management I
COMM 326	Human Resources Management II
COMM 336	Information Systems For Management
COMM 351	Financial Accounting
COMM 352	Managerial Accounting
COMM 361	Marketing Management
COMM 373	Business Finance
ECON 301	Intermediate Microeconomic Analysis
ECON 302	Intermediate Macroeconomic Analysis

Students deficient in English communication skills will be required to enrol in an English course authorized by the Commerce Masters' Programs' Office, and obtain a mark of at least 68% before being allowed to enrol in the second year of the M.B.A. program.

Applicants with university credits in relevant disciplines may, on application, be permitted to write exemption examinations for some of the above courses prior to registration in the Winter Session. Exemptions will be granted on a course-by-course basis.

Evening First-year Core Courses

To accommodate part-time students a section of each core course listed above will be offered in the evening between 6 and 10 pm, Monday through Thursday.

Second Year of Full-time Studies

The 30 credits of graduate courses for credit toward the M.B.A. degree are typically taken in the second year.

The general rules governing the M.B.A. program content provide that:

- at least 24 credits must be at the 500 level, or above,
- at least 18 credits must be taken within the Faculty of Commerce and Business Administration,
- All students are required to take Commerce 591 and to pass a comprehensive examination,
- to ensure adequate breadth, elective courses have to be selected from at least three different areas of management,
- students are required to write a graduating essay. The graduating essay shall go beyond the formal course work for the degree, but, where appropriate, may

originate in a formal course. Essays should demonstrate the candidate's ability to organize knowledge with some critical rigour in a form acceptable to the particular profession or academic discipline. The graduating essay carries no credit value.

- unless otherwise specified, the minimum prerequisites for all 500-level courses are completion of the first year Core Courses or permission of the instructor.

The M.B.A. is intended to be a general program and narrow specialization is discouraged. The general integrated nature of the M.B.A. program mitigates against the degree of specialized study normally required for a thesis. Students interested in developing a research capability, and in writing a thesis, should consider the M.Sc. program in which it is possible to develop a more specialized course of study.

M.Sc. (Business Administration) Degree

The M.Sc. (Business Administration) degree is intended for graduate students who wish to prepare for specialized careers in the performance of technical and analytical functions in organizations. In contrast to the M.B.A. program whose regulations prevent excessive specialization in any one area of study, the M.Sc. program allows as much concentration in any one field of study as may be consistent with the individual student's educational goals. It is expected that students entering this program will have the objectives of developing analytical and research competence in fields of specialty such as finance, industrial relations management, management science, accounting, management information systems, transportation and logistics, urban land economics, policy, international business, or marketing.

The M.Sc. program normally requires two years of study. The precise number of credits required of any individual depends upon the candidate's prior preparation and the number of first-year core courses required varies slightly between divisions.

It is emphasized that there is considerable flexibility in the rules governing the M.Sc. program, and students with specialized interests or with interests which involve work in other Faculties are encouraged to explore the possibility of developing an individual program to suit their special needs.

Degree Program

The program of study for an M.Sc. candidate is determined by an M.Sc. adviser and committee chosen to represent the area of specialization elected by the candidate. The course program will, therefore, differ for each student, will reflect the student's background, and will be developed by the M.Sc. adviser from the resources of the University community so as to best prepare the student for specific career objectives.

The M.Sc. program normally consists of a thesis (COMM 549) of six credits plus 24 credits in addition to the other course work prescribed for the field. The 24 credits of course work shall consist of at least 18 credits at the 500 level or above, and no more than six credits at the 300 or 400 levels.

Applicants who may be concerned about the proper choice of degree programs at the time of initial application may be assured that transfers from the M.B.A. to the M.Sc. program are possible, since the initial admission criteria are the same. However, students transferring from the M.Sc. to the M.B.A. program must satisfy the prerequisite course requirements for that program.

At the time of acceptance of an offer of admission to the M.Sc. (Business Administration) program, students will

be required to pay a non-refundable deposit of \$200, which will be applied to the first-term tuition fees.

Advanced Technology Management

M.Eng. and M.Sc. Degrees. For detailed information see separate entry.

Ph.D. Degree

The objectives of the Ph.D. program in Business Administration are to prepare appropriately qualified individuals for university teaching and for research positions in business and government. The degree of Doctor of Philosophy is the highest conferred by the University and is a research degree requiring general proficiency and distinctive attainment in a special field as well as an ability for independent investigation, evidenced by a dissertation based upon original research and creative scholarship.

Eight divisions of the Faculty of Commerce and Business Administration presently offer approved programs of study leading to the Ph.D. degree. These are:

- Accounting
- Finance
- Management Information Systems
- Management Science
- Marketing
- Organizational Behaviour
- Policy Analysis and Strategy
- Urban Land Economics

Within each of these general areas a variety of special fields may be studied. In addition, a student may pursue a cross-field program in the Faculty of Commerce and Business Administration or apply to the Faculty of Graduate Studies as an Interdisciplinary candidate for the Ph.D. degree. These alternatives allow specialization in such areas as Transportation or International Business, as well as programs of study which cross department or Faculty boundaries.

Since each candidate enters the program with a unique academic background and pursues a course of study which reflects the candidate's own special interests, it is possible to give only very approximate estimates of the time which may be necessary to complete the major phases of the program. However, doctoral work beyond the Master's degree in business administration or its equivalent ordinarily involves about two years of formal course work. Up to one additional year may be required of students who lack the preparation for doctoral research courses in business studies. The thesis research normally requires at least a year of additional work.

Students with limited financial resources should not be discouraged from applying for admission to the Ph.D. programs, since all students who are admitted, but who have not obtained financial assistance from an external source, will have access to some form of financial support.

Degree Program

The program of study for each entering Ph.D. student is determined by a faculty adviser drawn from the area of specialization, in consultation with the student. In those divisions with individual Ph.D. programs, an adviser has been appointed to supervise the early work of new candidates; this adviser transfers responsibility to a committee more closely representing the special research interests of the candidate as they develop. Applicants are encouraged to correspond with the Ph.D. advisers in their chosen fields of study (prior to entry), who will be glad to give information about the specific requirements of their area upon request. Such enquiries may be addressed initially

to the Director of the Ph.D. program, who will forward them to the appropriate faculty advisers.

The major phases of the program are as follows:

- 1) a basic core of suitable courses from the foundation areas of business research, including mathematics, statistics, economics, sociology and psychology, whose concepts and methods may be applied in research and in the process of decision-making.
- 2) a basic core of study of the management decision areas, which are defined to include subjects such as Accounting, Management Information Systems, Finance, Organizational Behaviour and Marketing.
- 3) a Preliminary Examination on the above, supervised by a Faculty committee, in foundation courses in which the candidate receives less than a 80% mark.
- 4) a study of the chosen field of specialization, including a knowledge and understanding of the literature of the field, the basic concepts, their origins, evolution, and relationship to cognate fields, and the application in the chosen field of advanced methods of research.
- 5) a written comprehensive examination in the field of specialization.
- 6) a formal thesis proposal, presented at an open workshop or seminar, and approved by the appropriate thesis committee.
- 7) a scholarly thesis supervised by the thesis committee.
- 8) an oral examination in defence of the completed thesis.

In the Management Science Program, the study defined in (1) and (2) is replaced by an intensive preparation in mathematical and statistical methods.

In some areas of specialization the defined special field of study will include a minor field of interest, and in the Management Science Program two minor fields are mandatory. Please refer to the relevant section for the guidelines used in some of the option areas.

Community and Regional Planning, School of

Professor and Director: W. E. Rees.

Professors: A. F. J. Artibise, H. C. Davis, A. H. J. Dorcay, M. C. Healey, H. C. Hightower, A. A. Jaquian, V. S. Pendakur, M. Y. Seclig.

Associate Professors: P. E. Boothroyd, T. A. Hutton.

Assistant Professors: P. Gurstein, Y.-T. Hsing, M. Leaf, T. L. McDaniels.

Adjunct Professors: P. Carney, J. Whitehead, J. Wollenberg, R. Young.

Ph.D., M.A. (Planning), M.Sc. (Planning), Certificate in Site Planning

The School of Community and Regional Planning (SCARP) was created in 1952 and has one of the largest planning programs in Canada. The Master's and Ph.D. degrees are recognized by the Canadian Institute of Planners and the American Institute of Certified Planners. The School's mission is to advance the transition to sustainability through excellence in integrated policy and planning research, professional education, and community service. We emphasize an integrated approach to planning through three concentrations or streams: community development planning, regional and natural resources planning, and international development planning.

SCARP's research arm, the Centre for Human Settlements, is involved in a wide variety of major research projects focusing on both North America and Asia. In

addition, several SCARP faculty are attached to the Westwater Research Centre.

Full details on SCARP can be found elsewhere in the *Calendar*; see index for page number.

Comparative Literature

Chair: E.-M. Kröller (English) (until June 30, 1995), T. Salumets (Germanic Studies) (as of July 1, 1995).

Committee: N. Frelick (French), A. Globe (English), D. Gregory (Geography), T. Hellwig (Asian Studies), P. Loeffler (Theatre), T. J. Salumets (Germanic Studies), S. Taubeneck (Germanic Studies).

Ph.D. and M.A. Degrees

The Program in Comparative Literature offers opportunities for advanced interdisciplinary study leading to the Ph.D. and M.A. degrees. Fields of study include literary theory, Asian literature, and the major literatures of Europe and of the Americas. Undergraduates who are interested in preparing for the degrees should acquire competence in at least two languages other than their native language. In addition, comprehensive knowledge of at least one, and preferably two, literatures should be acquired through study in a double Major program or through the Honours program of one of the language departments. 30 credits of coursework are required for the non-thesis M.A., 24 for the M.A. with thesis, and 18 for the Ph.D. M.A. students and Ph.D. students who have not already done so, will write the Qualifying Examination, a test of the literary theories which are fundamental to the discipline of Comparative Literature. Normally, in the second year, Ph.D. students will write their Candidacy Examinations and then proceed to the thesis. Details of seminars to be offered each year are given in the Program's brochure, *Comparative Literature Courses*. For detailed requirements concerning the M.A. degree, with or without thesis, and for the Ph.D., consult the Handbook for Graduate Students in Comparative Literature, available from The Program in Comparative Literature, University of British Columbia, 1866 Main Mall, Vancouver, B.C., Canada V6T 1Z1.

Computer Science

Professor and Acting Head: R. J. Woodham.

Professors: U. M. Ascher, K. S. Booth, S. T. Chanson, A. Fournier, D. G. Kirkpatrick, M. M. Klawe, A. K. Mackworth, N. Pippenger, J. M. Varah.

Associate Professors: J. J. Little, D. G. Lowe, G. W. Neufeld, D. Poole, R. S. Rosenberg, S. T. Vuong.

Assistant Professors: C. Boutilier, D. R. Forsey, M. R. Greenstreet, N. C. Hutchinson, J. J. Joyce, R. Ng, D. K. Pai, C. J. H. Seger, J. S. Snoeyink, A. S. Wagner.

Associate Members: R. Anstee, M. Ito, P. Lawrence, G. Schrack, B. Wetton, C. Woo.

Ph.D., and M.Sc. Degrees

The Department offers opportunities for advanced study leading to the M.Sc. and Ph.D. degrees. Fields of study include Artificial Intelligence (Computational Vision, Automated Reasoning and Language Understanding), Numerical Analysis, Theory of Computation (Computational Complexity, Computational Geometry, Parallel Processing), Computer Communications, Robotics, Integrated Systems Design, Computer Graphics, Distributed Systems, Databases, and Social Issues in Computing.

The Department maintains a collection of several hundred computers including Macintoshes and workstations

from SUN, NeXT, Silicon Graphics, IBM, HP, and MIPS. Modems are available for students to log on to the department's computers from off campus. Most machines run UNIX. The Laboratories for Computational Intelligence, the Imager Computer Graphics Laboratory, and the Systems Laboratories contain specialized equipment appropriate to their disciplines. The departmental networks are connected to a campus-wide network which is in turn connected to both commercial (Datapac) and research-oriented (BCnet, CA*net, CDNnet) wide area networks.

Detailed information on program requirements, courses, and financial assistance is available from the Department on request.

Counselling Psychology

Professor and Acting Head: B. C. Long.

Professors: J. A. Allan, N. E. Amundson, W. A. Borgen, J. R. Cochrane, J. D. Friesen, S. E. Kahn, M. Westwood, R. A. Young.

Associate Professors: J. Daniluk, B. E. Haverkamp, I. Ishiyama. Assistant Professors: D. F. Der, R. McCormick, R. J. Tolma.

The Department offers advanced study in school counselling, community counselling and student personnel services in higher education through its M.Ed. and M.A. programs. Both master's programs are accredited by the Council for Accreditation of Counselor and Related Educational Programs (CACREP). The Department also offers a Ph.D. program in counselling psychology. CPA/APA accreditation is being sought for the Ph.D. program.

M.Ed. Degree

The M.Ed. program involves advanced study in counselling theory and practice and an applied understanding of research. The M.Ed. is 48 credits in length, including a major essay, and does not normally lead to doctoral study. The program is available for full and part-time study.

Prerequisites: Completed four-year bachelor's degree, specific course prerequisites, and a senior-level course in each of learning theory, abnormal psychology plus UBC course CNPS 362 or its equivalent. In addition, the Graduate Record Examination general test and people-related work experience are required.

M.A. Degree

The M.A. program involves advanced study in counselling theory, practice, and research. The M.A. is 48 credits in length, including a thesis. It is available for full and part-time study.

Prerequisites: a completed four-year bachelor's degree; specific course prerequisites, a senior-level course in each of learning theory, abnormal psychology and statistics plus UBC courses CNPS 362, 363, 365 or equivalent. In addition, the Graduate Record Examination general test and people-related work experience are required.

Ph.D. Degree

The Ph.D. program uses a "scientist/practitioner" model to educate counselling psychologists as educators, researchers and practitioners. The program includes core courses in research issues in counselling psychology and advanced counselling theories. The dissertation requires students to complete a rigorous study involving original research. In addition, students participate in courses to further develop their counselling and supervisory skills. An internship of 1600 hours is also required.

Prerequisites: a research-based master's degree equivalent to the departmental M.A. degree, completed with

high standing. In addition, the Miller Analogies Test and a demonstration of counselling competence are required.

For further information, please contact the Department of Counselling Psychology, Faculty of Education, 2125 Main Mall, Neville Scarfe Building, Vancouver, B.C., V6T 1Z4; telephone (604) 822-5259, fax (604) 822-2328.

Creative Writing

Associate Professor and Acting Head: B. Wade.
Professors: S. A. Alderson, G. McWhirter.
Associate Professors: K. Maillard, C. J. Newman.
Assistant Professors: H. Hanson, I. Svendsen.

M.F.A. Degree

The Department offers a two-year course of resident study leading to the Master of Fine Arts degree. Candidates may choose to take the M.F.A. degree in Creative Writing, or the M.F.A. degree in Stage- or Screen-Playwriting offered in conjunction with the Theatre Department.

Admission

Applications may be submitted throughout the year but the deadline is November 1.

Candidates for the Creative Writing program should submit work in two or more of the genres listed in the brochure, specifying which is their major area of interest. Candidates who intend to focus on translation should submit translated material in any of the above genres and a sample of their own original creative writing.

Admission to the Stage- and Screen-Playwriting programs is on the basis of a script submission, including some work in another genre, and also relevant coursework in Theatre at the undergraduate level or equivalent.

Length of the manuscripts accompanying the application depends on choice of genres. Guidelines are available in the department.

The departmental brochure is available on request to the Department of Creative Writing.

Creative Writing

The program leading to the M.F.A. in Creative Writing is based on the premise that capable student authors can benefit from judicious criticism and the requirement to produce work regularly and to meet deadlines. Workshops, conferences, and tutorials are designed to focus attention on the student's poetry, fiction, drama, imaginative non-fiction, the writing of children's literature, and literary translation. Students are expected to read various books and journals for technical improvement in their own writing. For admission requirements, see below.

The Department publishes Prism International; graduate students participate in the editing and production of the magazine.

During the two years of the Creative Writing program, a minimum of 36 credits of work must be completed, including a thesis. (A reduction of the second-year residency requirement will be considered in exceptional circumstances.) The Creative Writing program consists of work in three genres, chosen in consultation with the Departmental adviser, as described in the Departmental brochure.

In the second year, students will complete a six-credit thesis consisting of a full-length work in the area(s) of their special interest. The thesis may be a substantial revision and extension of work done during the first year.

A work of translation may be used to fulfil the thesis requirement by students with the required ability and linguistic knowledge. (M.A. candidates in Comparative Literature who have their adviser's permission and are accepted by the instructor of the course in translation may include a translation in partial satisfaction of their thesis requirements.)

Students may be required to take advanced Creative Writing undergraduate courses and tutorials as part of their programs.

Stage- and Screen-Playwriting

The Creative Writing Department and the Theatre Department offer jointly two programs leading to the M.F.A. degree, one in Stage-Playwriting and the other in Screen-Playwriting. Applicants must be accepted by both Departments. For admission requirements, see below.

Students are required to take appropriate coursework in the Departments of Creative Writing and Theatre as described in their respective brochures. They must also be involved in the staging or production of some of their own work and, in fulfillment of the six-credit thesis requirement, write the equivalent of a full-length stageplay or TV or film script acceptable to both Departments. The thesis requirement must be met in the second year and may be a substantial revision and extension of work done during the first year.

Curriculum and Instruction, Centre for the Study of

Professor and Director: J. Willinsky.

Ph.D., M.A. and M.Ed. Degrees

Established by the Faculty of Education in 1976, the Centre for the Study of Curriculum and Instruction combines the features of both a research and program unit. Its programs include Master's degrees in Early Childhood Education, and Master's and Doctoral degrees in Curriculum and Instruction which span pre-school to post-secondary education, as well as non-traditional education settings. The Centre draws its faculty advisers for students from across the Faculty of Education which ensures that it can meet a wide range of academic interests and needs, as well as facilitating work on interdisciplinary research projects. By selecting instructors for its courses from various departments, the Centre is able to offer a number of perspectives in the key areas of curriculum theory, design, implementation, and evaluation, as well as in various aspects of Early Childhood Education. Students are also able to bring a focus to their studies in the Ts'Kel program, for First Nations education, and in Asia-Pacific educational studies. Through the Curriculum Centre's close association with the Centre for the Study of Teacher Education, it is able to support students pursuing studies in teacher education as an aspect of instructional development. There are also initiatives underway in antiracist and feminist education, global education, critical pedagogy, critical thinking, medical education, multicultural education, parent and community involvement, postcolonial studies, and school-subject integration. As well, the Centre oversees the innovative publishing activities of the Faculty of Education's Pacific Educational Press.

M.A./M.Ed. Degrees

The M.A. (thesis) and M.Ed. (non-thesis) degrees can be completed on a part-time basis. In addition to the regular materials requested in the university's application, stu-

dents should include a statement of their educational interests.

Ph.D. Degree

Candidates require (a) a Master's degree with high standing in a relevant educational discipline, (b) a sample of scholarly work, (c) a letter of intent describing the proposed focus of the program, and (d) the support of three academic referees. For students possessing a thesis-based Master's degree from other than a relevant curricular discipline, it may be possible to proceed into the Ph.D. by taking, and achieving a high standing in, the core course requirements of an appropriate Master's degree in education at UBC.

For further information, please contact: Centre for the Study of Curriculum and Instruction, Faculty of Education, 2125 Main Mall, Vancouver, B.C., V6T 1Z4; telephone (604) 822-6502, fax (604) 822-8234.

Curriculum Studies

Professor and Head: D. F. Robitaille.

Ph.D., Ed.D., M.A. and M.Ed. Degrees

The department is one of five departments in the Faculty of Education. It offers M.Ed. and M.A. programs in specialized areas of Art Education, Business Education, Home Economics Education, Mathematics Education, Music Education, Science Education, Social Studies Education, and Technology Studies Education. It offers an Ed.D. in Mathematics, Music Education, and Science Education, and a Ph.D. in Curriculum and Instruction with a focus on the department's areas of specialization. Interested students should refer to the section of the *Calendar* on the Centre for the Study of Curriculum and Instruction for details of the Ph.D. program.

Masters programs can be complete through part-time or full-time study. Both the M.Ed. and M.A. programs consist of at least 30 credits of coursework at the 300 level or above with at least 24 credits of coursework selected from courses numbered 500 or above. In addition, the M.Ed. program includes comprehensive examinations and a major paper (three credits). The M.A. programs includes completion of a thesis (six credits).

Faculty in the Department have research interests in assessment, testing and measurement; constructivist approaches to teaching and learning, critical thinking and problem solving, curriculum development, change, implementation, and evaluation; environmental and outdoor education, family life education, gender theory and schooling, global and multicultural education, historical and social analysis of curriculum, cultural influences and issues in education, learning in informal environments, multimedia ethnography, mathematical, scientific, technological and visual literacy; school based collaborative research, health education, teacher education, and computer applications across the curriculum.

Applicants to masters programs are normally required to have two years of teaching experience. All applicants must submit with their applications a statement of intent clearly outlining their areas of interest and focus for study. Doctoral applicants are required to submit a sample of their writing.

For further information, please contact the Graduate Secretary, Department of Curriculum Studies, Faculty of Education, 2125 Main Mall, Vancouver, B.C. V6T 1Z4; telephone (604) 822-5367, fax (604) 822-9366.

Dental Science

Dean: E. H. K. Yen.

Professors: D. M. Brunette, V. M. Diewert, D. Donaldson, A. G. Hannam, A. A. Lowe, M. I. MacEntee, B. C. McBride, C. Price, V. V.-J. Uitto.

Associate Professors: B. Blasberg, D. C. Clark, T. Jastak, H. Larjava, L. M. Rucker, R. M. Shah, J. G. Silver, J. D. Waterfield.

Assistant Professors: J. Coil, R. L. Harrison, D. McDonnell, C. M. Overall, R.W. Priddy, N. D. Rusc, J. N. Walton, C. B. Wu, L. Zhang.

M.Sc. Degree

(See also Oral Biology, Ph.D. Degree; Dentistry, Post-Graduate Training Programs.)

The Faculty of Dentistry offers facilities and opportunities for advanced study leading to the degree of M.Sc. in Dental Science. Candidates will be accepted under the general regulations of the Faculty of Graduate Studies to study in one of the major recognized fields of dentistry, and the program will ordinarily require two full academic years.

In addition, the program provides an opportunity for qualified students to enter combined programs leading to both certification in either Periodontics, Oral Medicine, Oral Pathology or Oral Radiology (for which diplomas are awarded), and an MSc. in Dental Science. The application deadline for the combined programs is October 1.

An essential prerequisite is the prior completion of undergraduate courses in the subject at least equivalent to those offered in the Dental Undergraduate Program.

A program of part-time graduate studies is also available.

Economics

Professor and Head: W. C. Riddell.

Professors: R. C. Allen, C. Blackorby, P. G. Bradley, J. G. Cragg, M. Devereux, W. E. Diewert, D. J. Donaldson, M. Eswaran, R. G. Evans, J. F. Hellawell, K. Hendricks, S. P. S. Ho, J. R. Kesselman, A. Kotwal, G. R. Munro, K. Nagatani, P. A. Neher, D. G. Paterson, A. Redish, W. C. Riddell, W. E. Schworm, R. A. Shearer, M. Slade, R. S. Uhler, T. J. Wales, J. Weymark, K. J. White, R. M. Will.

Associate Professors: B. Copeland, G. B. Hainsworth, H. Neary.

Assistant Professors: J. D. Boyd, D. Green, J. Nason.

M. Piccione, J. Pinkse, M. Saito, G. Tan, M.S. Taylor.

Ph.D. and M.A. Degrees

The program leading to the degree of Master of Arts is designed to prepare the student for employment in business or government or to serve as a first stage in a program leading to the Ph.D. degree. The studies leading to the degree of Doctor of Philosophy are designed to equip the student to carry out research, with a view toward a career in university teaching, business or government. With a faculty of 40 members, the Department of Economics is able to offer courses and seminars and to supervise research in a wide variety of subjects. Among others these include economics of natural resources, growth theory, economic development, micro-economic theory and macro-economic theory and policy, economic history, econometrics, international trade and finance, industrial organization, public finance, industrial relations, labour economics, monetary theory and policy, cost benefit analysis, and game theory and information.

The University Library's holdings in economics are particularly extensive in serial publications and the postwar literature. Graduate students also use the special collec-

tion of the Economics Reading Room, which contains the principal professional journals and frequently-used books. Special research facilities include the University Computing Centre and Arts Computing. Arts Computing offers guidance and assistance to faculty members and graduate students conducting quantitatively oriented research in the social sciences. Its library of frequently-used software is constantly being expanded. The services of computer programs are available through Arts Computing.

A listing and description of the courses offered each year are contained in a detailed brochure available on application to the Department.

Education

Associate Dean, Graduate Programs and Research: J. Gaskell.

Ed.D., Ph.D., M.Ed. and M.A. Degrees

Graduate programs in education are offered by all departments in the Faculty and by the Centre for the Study of Curriculum and Instruction. In many cases, students are qualified for more than one program, and should explore the alternatives that are offered. Complete listings may be found under the individual unit entries under the Graduate Studies listing. General information on graduate programs in education may be obtained from the Office of Graduate Programs and Research, Faculty of Education, 2125 Main Mall, Vancouver, B. C. V6T 1Z4; telephone (604) 822-5512, fax (604) 822-8971.

The following are the departments and the centre within the Faculty of Education and the programs they offer:

- The Centre for the Study of Curriculum and Instruction offers graduate programs in Curriculum and Instruction and Early Childhood Education.
- The Department of Counselling Psychology offers graduate programs in Counselling Psychology.
- The Department of Curriculum Studies offers graduate programs in Art Education, Business Education, Home Economics Education, Mathematics Education, Music Education, Science Education, Social Studies Education, and Technology Studies Education.
- The Department of Educational Psychology and Special Education offers graduate programs in Educational Psychology; Human Learning, Development and Instruction; Measurement, Evaluation and Research Methodology; School Psychology; and Special Education.
- The Department of Educational Studies offers graduate programs in Adult Education, Educational Administration, Higher Education, History of Education, Philosophy of Education, Sociology of Education and Educational Studies.
- The Department of Language Education offers graduate programs in English Language Arts, English as a Second Language, Reading, Teacher Librarianship and Modern Languages.

Where appropriate, joint programs, which involve collaboration among the areas listed above, or which involve an area outside the Faculty of Education can be arranged.

Off-Campus Graduate Work

It may be possible for the Faculty of Education to organize graduate programs which have off-campus components offered at locations throughout B.C.

For further information, contact the Department or Centre within the Faculty of Education offering the program.

Note: Not all graduate programs are offered in a given year.

Educational Psychology and Special Education

Professor and Head: P. K. Arlin.

M.A. and M.Ed. Degrees

The Department offers master's degrees in the following program areas.

- Educational Psychology (EDPS): M.Ed.
- Human Learning, Development and Instruction (HLDI): M.A.
- Measurement, Evaluation and Research Methodology (MERM): M.A. and M.Ed.
- School Psychology (SCPS): M.A.
- Special Education (SPED): M.A. and M.Ed.

Master's degrees in Special Education are available with a concentration in the education of the deaf and hard of hearing and in the education of the blind, visually impaired and visually/multiple handicapped as well as in a general program in Special Education. A combined Special Education Educational Administration program is also offered.

An opportunity to include a Ts'Kel component with a master's program is available to First Nations students and others interested in Native Indian Education.

With the exception of School Psychology and the specialized concentrations in Special Education, all of the master's program in Educational Psychology and Special Education are available on a part-time basis.

Ph.D. Degree

The Department offers the Ph.D. degree in Educational Psychology and Special Education. Since this is a department-wide degree, students are expected to develop a basic understanding of all of the areas of specialization within the Department. The specific focus of a doctoral program will be determined by the student's research interest, professional objectives and preparation at the master's level.

Information about admissions and program requirements for the M.A., M.Ed., and Ph.D. degrees may be obtained from the Graduate Secretary of the Department of Educational Psychology and Special Education, Faculty of Education, 2125 Main Mall, Vancouver, B.C., Canada, V6T 1Z4; telephone (604) 822-5351, TDD: (604) 822-8229, fax (604) 822-3302.

Educational Studies

M.A., M.Ed., Ed.D and Ph.D. Degrees

The Department is concerned with the study of education in a broad sense. It represents a combination of programs (in adult and higher education and in educational administration) and educational disciplines (sociology, history, philosophy and anthropology). The Department is committed both to meeting traditional program needs and to developing innovative and integrated approaches to emerging issues in education. In addition to specialists in the programs and discipline fields noted above, the Department's faculty include those using cross-disciplinary approaches to issues in areas such as childhood, critical thinking, First Nations education, gender, international education, multiculturalism, policy studies and race relations.

The Department offers M.Ed. and M.A. programs in all areas of its work, including a specialization in First Na-

tions' schools for students of aboriginal ancestry who register in the Ts'kel program. The Masters programs can be taken on a part- or full-time basis. Ed.D. programs are available in adult education and educational administration (including the study of issues in higher education), and the Ph.D. offers the opportunity to study policy issues in education from a variety of perspectives. Graduates of the department are well qualified for leadership positions in their chosen fields. A high proportion of the graduates from the doctoral programs occupy teaching and research positions in post-secondary institutions or other agencies in Canada and elsewhere, or senior positions in school systems.

Students admitted to the Department's programs have a wide range of undergraduate qualifications and often will have some years of professional experience in education or a related field. Applicants are asked to provide (in addition to the forms, references, transcripts and other material required by the Faculty of Graduate Studies) a statement of their scholarly and professional interests and aspirations. These are considered carefully in admissions decisions.

Coursework in the M.Ed. and M.A. programs is a minimum of 30 credits, consisting of core and elective courses, depending on the specialization chosen. A comprehensive examination is required in some programs. The M.Ed. requires a graduating paper in which the student explores concepts, previous research or the application of his or her knowledge to the field of practice. M.A. programs require a thesis reporting the results of the student's original research. The Department's doctoral programs require a doctoral seminar, and such courses as are decided in consultations with one's adviser. These are tailored to each student's particular interests and to the development of his or her dissertation research.

For further information please contact:

- Educational Studies – Dr. J. Barman, (604) 822-5331, fax (604) 822-4244
- Adult Education – Dr. T. Sork, (604) 822-5702, fax (604) 822-6679
- Educational Administration – Dr. D. J. Brown, (604) 822-4588, fax (604) 822-9297
- Higher Education – Dr. H. G. Schuetze, (604) 822-4860, fax (604) 822-9297.

Electrical Engineering

Professor and Head: R. W. Donaldson.

Professors: H. W. Dommel, R. W. Donaldson, G. A. Dumont, M. R. Ito, E. V. Jull, C. A. Laszlo, P. D. Lawrence, C. S. K. Leung, D. L. Pulfrey, A. C. Soudack, K. D. Srivastava, T. Tiedje (joint appointment with Physics), R. K. Ward, L. M. Wedepohl.

Associate Professors: I. G. Cumming, M. S. Davies, W. G. Dunford, A. Ivanov, N. A. F. Jaeger, S. Kalle, V. C. M. Leung, J. R. Marti, P. T. Mathiopoulos, G. F. Schrack.

Assistant Professors: H. M. Alnuweiri, G. W. Bond, D. W. Gillies, G. E. Howard, M. K. Jackson, C. C. H. Ma, M. R. Palmer, S. E. Salcudean (joint appointment with Forest Resources Management), R. F. B. Turner (joint appointment with Biotechnology Laboratory), M. D. Wong, M. J. Yedlin (joint appointment with Geophysics).

Prerequisites: graduation in Electrical Engineering, Engineering Physics, Physics, Computer Science or other related subjects. Some students may be required to supplement their graduate studies by taking specific under-

graduate courses in Electrical Engineering. Alternatively, interdisciplinary degrees may be appropriate and can be arranged.

Facilities are provided for research in: applied electromagnetics; biomedical engineering; communications and signal processing; computers and computer applications; digital system design, VLSI design, and software engineering; power systems and power electronics; solid state devices; microelectronics and optoelectronics; robotics and telerobotics; systems and control.

Collaboration with other departments is facilitated by membership in the Advanced Materials and Process Engineering Laboratories (AMPEL) and the Centre for Integrated Computer Systems Research (CICSR).

Qualified students are admissible to programs leading to degrees of M.A.Sc. and M.Eng. on a part-time basis.

Ph.D. Degree

The course includes a thesis and 24 credits of approved courses. For those holding a Master's degree or transferring from a Master's program, appropriate credit will be given for courses completed.

M.A.Sc. Degree in Electrical Engineering

The course includes a thesis plus (as a minimum) the University requirement of 18 credits of approved courses, 12 of which must be at the 500 level. Normally at least 6 of the 18 credits will be taken in this Department, 12 credits for students with degrees in subjects other than electrical engineering.

M.Eng. Degree

The degree of M.Eng. may be obtained on the basis of the completion of 30 credits of course work together with an essay or report and a comprehensive examination. This degree is intended mainly for candidates who may wish to extend their knowledge after a period of engineering practice following first graduation.

Students should consult the Department for information regarding courses to be offered. A departmental graduate studies booklet providing more details and describing current research projects is available on request.

Engineering Physics

M.A.Sc. Degree

See Physics.

English

Professor and Head: H. J. Rosengarten.

Graduate Committee Chair: I. B. Nadel.

Professors: K. Alldritt, R. W. Bevis, A. B. Dawson, E. Durbach, J. W. Foster, A. V. Globe, G. Good, S. E. Grace, L. M. Johnson, J. Kaplan, E.-M. Kröller, E. R. Labrie, J. A. Lavin, P. Merivale, I. B. Nadel, W. H. New, G. E. Powell, P. A. Quartermain, L. R. Ricou, H. J. Rosengarten, P. G. Stanwood, J. Wasserman, M. L. Weir, G. R. Wieland, J. L. Wisenthal.

Associate Professors: M. A. H. Blom, T. E. Blom, L. J. Brinton, A. Busza, D. R. Danielson, D. L. Evans, M. Fee, R. B. Hatch, N. Hudson, E. P. Levv, M. J. Powell, R. G. Seamon, S. W. Stevenson, J. F. Stewart.

Assistant Professors: L. J. Arnovick, R. Cavell, J. X. Cooper, P. Dalziel, G. Deer, S. Echard, S. Egan, K. Hanson, I. Higgins, J. K. Kealy, M. H. Kirklev, C. Milsum, S. Partridge, J. Segal, F. E. Stockholder, P. A. Taylor, S. Tomic, P. van Toorn, M. Vessey, P. Yachnin, M. Zeitlin.

Ph.D. and M.A. Degrees

The Department offers opportunities for advanced study in English, American, Canadian, and Commonwealth literature, and in English language including rhetoric. The Library has excellent working collections in most areas and particularly strong collections of periodicals, Malcolm Lowry materials, modern Irish Literature, Canadiana, and, in the Colbeck Collection, nineteenth- and early twentieth-century English literature. Seminars are offered annually in the major periods, figures, genres and critical approaches. The Department's brochure of English Courses Offered provides extensive descriptions of each seminar. For detailed requirements concerning the M.A. degree, with or without thesis, the Ph.D. program, and the possibility of part-time study for the Master's degree, students should consult the Departmental Graduate Handbook.

Ethnic Studies

Chair: R. Menkis (Religious Studies).

Ethnic Studies refers here to work on ethnic relations in the context of the multicultural nature of Canadian society. Work is normally centred on a single ethnic group, on relations between ethnic groups, or on a comparison of the Canadian situation with that in other countries. Such studies involve numerous disciplines, e.g., history and political science, anthropology and sociology, language and literature, health and education, and are carried on in various departments, schools and faculties within the university. Subjects may range widely, for example, from ethno-musicology to nutrition, and are frequently studied on an interdisciplinary or inter-faculty basis.

Although there is no Department of Ethnic Studies at UBC and no formal program leading to a degree in this field, many departments throughout the university offer courses relevant to Ethnic Studies and related areas. A student wishing to specialize in Ethnic Studies at the graduate level will normally be located in a single department and follow a normal degree program. Such students should therefore consult the Committee on Ethnic Studies for guidance in planning their coursework. This should be done at the time of applying for admission to the Faculty of Graduate Studies.

Resources and departmental course offerings are adequate to support some ethnic studies programs at the graduate level and funds are available from a variety of sources to support research projects. The Committee should be consulted for details.

Experimental Medicine

Director: N. L. M. Wong, Experimental Medicine, Department of Medicine.

Ph.D. and M.Sc. Degrees

The program is intended for individuals seeking a career in research through training in experimental medicine. It furnishes the opportunity for students to work towards a M.Sc. or Ph.D. degree in Experimental Medicine in the Divisions of Cardiology, Gastroenterology, Infectious Diseases, Nephrology, Neurology, and Respiratory Medicine and in the area of Molecular Medicine, all of which may involve patients and/or experimental animal models. It is anticipated that normally applicants for the M.Sc. program will have a B.Sc. in Life Sciences, Biology, Zoology or Biochemistry, while the Ph.D. applicant will have

M.D., D.M.D., D.V.M. degrees or a M.Sc. in Life Sciences, Biology, Zoology or Biochemistry. Students with equivalent degrees may also apply for admission. The admission requirements of the Faculty of Graduate Studies must be satisfied. The student's research program must be acceptable to his or her research supervisor as well as to the Committee on Graduate Studies in the Experimental Medicine Program.

Students should consult the Experimental Medicine Program for further information. A booklet providing details on the program and describing current research projects is available on request.

Family and Nutritional Sciences

See Family Studies and Human Nutrition.

Family Studies

(School of Family and Nutritional Sciences)

Professor and Acting Director: M. Arcus.
Professor: D. Perlman.
Associate Professors: P. J. Johnson, E. L. Väines, J. White.
Assistant Professor: B. de Vries.

M.A. Degree

The Division of Family Science of the School of Family and Nutritional Sciences offers opportunities for advanced study in the family. The M.A. program in Family Studies is intended to equip graduates with the competency to advance knowledge as well as to apply that knowledge in a variety of community settings. The program is interdisciplinary in nature, stressing work in the behavioural sciences relevant to the family, and its alternatives. Both the place of the family in society and the internal dynamics of relationships are examined. The emphasis is on the non-pathological, North American family, studied over the life span.

Admission

Applicants must satisfy the normal admission requirements of the Faculty of Graduate Studies and must have completed an appropriate degree in one of the social sciences or in Home Economics with some undergraduate courses in the area of the family. The admissions committee will make individual judgements concerning other prospective students who do not meet these requirements but who may be admitted contingent upon making up deficiencies. In all cases, preference will be given to those having a substantial background in the social sciences. Applicants should note that Family Studies 523 requires previous completion of a course in behavioural research methods and Statistics 203 or equivalent.

Program Requirements

The Master's degree program requires a minimum of 30 credits of course work, of which at least 18 credits must be at the 500 level and at least 18 credits must be in Family Science (FMSC) or Family Studies (FMST) including the three required courses: Family Studies 520 Theories about the Family, Family Studies 523 Analyzing Data in Family Studies, and Family Studies 524 Family Development. Elective Courses which form a coherent plan of study compose the remainder of the course work. In addition to the formal course work, as evidence of research and scholarly capability, a thesis (6-12 credits) is required.

Film

M.A. and M.F.A. Degrees

See programs in Theatre and Film.

Fine Arts

Professor and Head: J. O. Caswell.
Professors: S. Guilbaut, J. Wall, R. Windsor-Liscombe.
Associate Professors: M. Cohodas, M. Matsumoto, J. O'Brian,
R. Prince, R. M. San Juan, B. Ziegler, R. Young.
Assistant Professors: W. Dobreiner, K. Hacker, C. Knicely,
K. Lum, M. Ryan, J. Williams.
Senior Instructor: M. Pessin.

The Department offers opportunities for advanced study of art history in the major periods of European and North American art, in certain areas of Asian art and in the indigenous arts of the Americas leading to the Ph.D. and M.A. degrees. It also offers advanced studies in studio work, leading to the M.F.A. degree.

The region offers good collections of modern Canadian painting, sculpture and architecture, and relatively rich collections of Asian art and the indigenous arts of the Americas. The Fine Arts Library has holdings of some 180,000 books and over 400 current periodicals, and can support advanced research in all areas.

Graduate students are encouraged to travel during their graduate work, to gain wider first-hand experience of the works of art with which they are concerned and the sources of information relating to them.

M.A. Program

The M.A. in art history requires 24 credits of course work (including a minimum of 18 credits at the 500-level), a six-credit thesis and a reading knowledge of one language (other than English) relevant to the field of study.

M.F.A. Program

The program focuses upon painting and drawing, printmaking, photography, and sculpture. Training in applied arts, commercial art and design, and film and television is excluded.

Applications will be considered from: 1) persons who hold a Bachelor's degree and satisfy the requirements for admission to Graduate Studies; 2) in special circumstances, artists who demonstrate advanced artistic achievement and would benefit from the program.

An assessment of a portfolio of work and of previous course work is basic to the consideration of each application. There must be evidence that the applicant, if admitted, will benefit from the academic components of the M.F.A. program. The evidence may include transcripts of academic work at an advanced level, published writing, or other evidence of achievement.

The M.F.A. Program requires two academic years of course work and, no fewer than two calendar years and no more than five years after initial registration in the program, a final presentation. The specific requirements are as follows:

- 1) Fine Arts 581 (12) and Fine Arts 582 (12). These two courses constitute an integrated, two-year studio program worked out for each student by the staff of the Department in consultation with the student, leading to the final presentation.
- 2) Academic courses, numbered 400 or above, carrying a total of 12 credits.

The final presentation of the M.F.A. program will be an exhibition of work offered by the candidate at an agreed time and place. This exhibition must demonstrate to the satisfaction of the faculty the candidate's capacity for independent creative work and must be accompanied at the opening by an extended written statement which places the creative work in the context of both the intellectual interests of the candidate and a wider field of study. Normally, at least one external examiner will be involved in the examination of the final presentation.

Ph.D. Program

The Ph.D. in art history is open to well-qualified candidates who can outline a program which takes full benefit of available resources and faculty.

Brochures giving details of each program, descriptions of courses and other information are available from the Departmental office.

Fire Protection Engineering

Associate Professor: J. R. McHaffey (Chemical Engineering).

(This program has been approved, and funding is being sought. If this funding is obtained by April 15, 1995, the program will begin in September 1995.)

A program in Fire Protection Engineering leading to an M.Eng. degree is offered to qualified engineering graduates seeking to acquire graduate-level education for the practice of engineering in fire protection. The program is designed for students with a baccalaureate (or equivalent) degree from an accredited or well-recognized engineering program.

Required courses are a minimum of 30 credits of graduate Fire Protection Engineering courses (including FPEN 598) plus a minimum of six credits of elective courses. Depending on the field of the baccalaureate degree, additional courses may be required. These elective courses must be approved by the Program Director. A comprehensive examination is required upon the completion of all course work.

Fisheries Centre

Director and Professor: T. J. Pitcher (Fisheries Centre/Zoology).
Professors: C. Clark (Mathematics), B. Elliot (Environmental Sociology), M. C. Healey (Fisheries Centre/Westwater/Oceanography), S. Hinch (Forestry/Fisheries Centre/Westwater), G. Iwama (Animal Science), P. LeBlond (Oceanography), J. D. McPhail (Zoology), P. Marchak (Political Economics), G. Munro (Economics), W. Neill (Fisheries Centre/Zoology), D. Newell (History of Fishers Communities), D. Pauly (Fisheries Centre/Zoology), P. Pearse (Forestry), R. Petrell (Applied Science), W. Rees (Community and Regional Planning), J. Thompson (Animal Science), A. Trites (Fisheries Centre/Zoology), C. Walters (Fisheries Centre/Zoology).
Emeritus Professors: P. Larkin, D. Ludwig, T.D. Northcote, N. Wilimovsky.

The Fisheries Centre aims to focus and promote the multidisciplinary study of fisheries. Analytical tools developed in a broad spectrum of parent subjects, including biology, oceanography, economics, engineering, mathematics, sociology, planning and policy are employed in order to assess, appraise and forecast the impacts of both human and natural processes on fishery resources.

Fisheries policy and management problems under study include assessment and management of artisanal and

commercial food capture fisheries, aquaculture biology and engineering, recreational fisheries, coastal and watershed management, conflict resolution and the co-management of shared fishery resources, and the conservation of endangered exploited species in both marine and freshwater environments. Major objectives are to establish a fully international, multidisciplinary perspective, and to provide a forum for the foundation of concepts of management and sustainable development of fisheries appropriate for the next century.

The Fisheries Centre organises research, courses, seminars, workshops, professional training courses and publications that aim to promote a deeper understanding of management and development of fisheries resources around the globe. The Fisheries Centre forms a base for a research community of Faculty, Research Associates, Postdoctoral Fellows, Graduate Students and off-campus Adjuncts. It provides a Resources Centre comprising reference material and computing facilities for analysis and assessment of fisheries, and maintains, together with Oceanography, a reading room and library linked to the main UBC library system.

At present, four research units are based within the Fisheries Centre. The BC Fisheries Research Section (Director, Dr. Art Tautz) works on freshwater management, mitigation and recreational fisheries in the province. The Marine Mammal Research Unit (Director, Dr. Andrew Trites) is concerned with the interactions between mammal and fish resources in the North Pacific and in particular the fisheries impact and conservation of Steller sea lions and harbour seals. The Fisheries Development and Planning Group (Chair, Ron Macleod) examines fisheries management, economics, development and policy in relation to fishery resources world-wide. The Common Ground Project aims to provide a neutral forum and appropriate analytical tools for the resolution of sectoral conflicts in fisheries.

The Director is directly responsible to the Dean of the Faculty of Graduate Studies. Students within the Fisheries Centre are currently attached to the interdisciplinary Resource Management Science program, or to Zoology, Economics, Animal Science or other disciplinary program as appropriate to their research project. The Fisheries Centre organizes a series of core and modular courses on fisheries topics and issues: full details are available on request.

For more information contact the Fisheries Centre, 2204 Main Mall, The University of British Columbia, Vancouver, B.C., Canada V6T 1Z4; telephone (604) 822-2731, fax (604) 822-8934; e-mail: tautz@bcu.ubc.ca.

Food Science

Associate Professor and Acting Head: J. Vanderstoep.

Professor: J. F. Richards.

Honorary Professors: S. Nakai, W. D. Powrie.

Associate Professor: T. D. Durancc, D. D. Kitts, E. C. Y. Li-Chan, B. J. Skura.

Ph.D. and M.Sc. Degrees

The Department offers opportunities for advanced study in the fields of food chemistry, physical bromatology, structural bromatology, environmental bromatology, food toxicology and food process science. Fundamental studies may be undertaken on any of the major food systems. The Department is particularly well-equipped for research in the areas of single cell culture, fermentation, chemical identification, microstructure, rheological properties and

sensory evaluation of foods. Equipment available to graduate students includes an electron microscope, an amino acid analyzer, ultracentrifuge capable of sedimentation analysis, electrophoretic and chromatographic analysis equipment, differential thermal analyzer, Raman spectrophotometer, recording spectrophotometers, recording spectropolarimeter, spin-resonance spectrophotometer, Brabender viscometer, Instron testing machine, fermenters and incubators, small animal facilities, a freeze-dryer, spray driers and standard pilot plant equipment. The Library holdings in Food Science are extensive and include all major serials and reference works. In addition the Library has a particularly strong collection in the supporting Sciences.

Further information may be obtained by writing to the Head of the Department.

Forestry

Professor and Dean: C. S. Binkley.

Professor and Associate Dean of Graduate Studies and Research: J. A. McLean.

Professors: T. M. Ballard, J. D. Barrett, G. Baskerville, F. L. Bunnell, D. Haley, J. P. Kimmins, K. Klinka, A. Kozak, J. A. McLean, D. D. Munro, P. A. Murtha, G. Namkoong, L. Paszner, P. H. Pearse, J. N. R. Ruddick, J. N. Saddler, P. Steiner, G. F. Weetman.

Associate Professors: S. Avramidis, C. Breuil, J. Carlson, A. D. Chambers, C. P. Chanway, D. H. Cohen, P. J. Dooling, R. J. Fannin (joint appointment with Civil Engineering), M. C. Feller, D. L. Golding, R. D. Guy, A. F. Howard, B. J. van der Kamp, V. LeMay, P. L. Marshall, K. M. Martin, J. D. Nelson, T. P. Sullivan, G. C. Van Kooten, J. G. Worrall, G. G. Young.

Assistant Professors: P. D. Burton, S. Ellis, S. Hinch, F. Lam, T. C. Maness, H. Prion (joint with Civil Engineering), S. Salcedean (joint with Electrical Engineering), D. E. N. Tait, D. Tindall.

Ph.D. Degree

Opportunities are offered for advanced study in certain fields concerned with the basic scientific, managerial or economic aspects of forestry and wood science. The Faculty of Forestry also co-operates with other departments in offering advanced work in such fields as forest ecology, forest economics, forest genetics, forest hydrology, forest pathology, forest entomology, forest soils, forest recreation, forest range management, tree physiology, wood anatomy, wood products marketing, chemistry, pulp and paper, wood products engineering and physics, forest harvesting, operations research and planning systems, wildlife biology and remote sensing.

M.F. Degree

In major branches of Forestry, including biometrics, ecology, economics, entomology, fire control and use, tree breeding, forest hydrology, harvesting, land management, mensuration, operations research, pathology, photo interpretation, tree physiology, wood preservation, composite products and wood adhesives, range management, recreation, remote sensing, resource management, silvics, silviculture, soils, timber management, wildlife management, wood science, wood products marketing, pulp and paper, forest harvesting and planning systems, operations research, and engineering.

Prerequisite: Bachelor's degree equivalent to the B.S.F., or B.A.Sc in Forest Engineering.

The M.F. course of study includes a thesis, counting at least six credits, at least six credits chosen from graduate courses in the Faculty, including Forestry 545 or 584, or

approved alternate, and other courses to complete the requirements. Alternatively, the Program with Comprehensive Examination may be taken without thesis as described under "Courses of Study".

M.Sc. Degree

In fields as noted above for the Ph.D. degree.

Prerequisite: Graduation in Science, Applied Science, Agricultural Sciences, Social Science or Forestry.

The M.Sc. course of study includes a thesis, counting at least six credits, at least six credits chosen from graduate courses in Forestry, including Forestry 545 or 584, or approved alternate, and other approved courses appropriate to the field of study. Alternatively, the Program with Comprehensive Examination may be taken without thesis.

M.A.Sc. Degree

Prerequisite: B.A.Sc. or higher degree in Engineering.

The M.A.Sc. course of study includes a thesis, counting at least six credits, at least six credits chosen from graduate courses in Forestry, including Forestry 545, 547 or 584 or approved alternate, at least six credits chosen from the 300, 400, or 500 series in a department of Applied Science, and other approved courses.

Formal lecture courses or seminars are indicated by a single credit value assigned to them. In all problem and research courses, as indicated by a variable number of credits, individual laboratory or field investigations or reviews of literature are usually planned to serve the special interests of individual students. When several students have a similar interest in advanced study, formal lectures or seminars may be given.

The staff members listed with the graduate courses are responsible for course administration through the Director of Forestry Graduate Studies. Staff members other than those listed may direct studies in specialized topics for interested students, on recommendation of the Director.

The Western Laboratory of Forintek Canada Corp. located on the campus, cooperates in respect to facilities, special equipment and research direction.

French

Professor and Head: V. Raoul.

Professors: H. Curat, R. Hodgson, R. Sarkonak.

Associate Professors: R. Beaudoin, O. Cragg, S. Godfrey, J. A. McEachern, D. Rogers.

Assistant Professors: N. Frelick, R. G. C. Holdaway.

A. Lamontagne, C. Phan, A.-M. Rocheleau, C. Rouget, F. B. St. Clair, W. Winder.

Ph.D. and M.A. Degrees

The Department of French offers opportunities for advanced study in the language and literature of France, French Canada and French Africa. For a detailed outline of specific Ph.D. and M.A. programs and information about library resources, write to the Graduate Adviser of the Department.

As early as possible, the Department makes available a list of courses to be offered, usually in February of the preceding academic year.

Genetics

Advisory Committee on Genetics

Chair: J. E. Carlson (Forest Sciences and Biotechnology Laboratory)

Members: J. T. Beatty (Microbiology), C. Douglas (Botany), J. M. Friedman (Medical Genetics), T. A. Grigliatti (Zoology), R. K. Humphries (Medicine), F. Jirik (Medicine), D. M. Juriloff (Medical Genetics), W. R. McMaster (Medical Genetics), D. Mager (Medical Genetics), D. G. Moerman (Zoology), G. Namkoong (Forest Sciences), A. M. Rose (Medical Genetics), I. Sadowksi (Biochemistry), G. B. Spiegelman (Microbiology).

Faculty Members of the Genetics Program

Professors: D. A. Applegarth (Pediatrics), C. R. Astell (Biochemistry), P. A. Baird (Medical Genetics), H. W. Brock (Zoology), E. P. M. Candido (Biochemistry), P. P. Dennis (Biochemistry), C. J. Eaves (Medical Genetics), J. M. Friedman (Medical Genetics), F. R. Ganders (Botany), S. Gillam (Pathology), B. R. Green (Botany), A. Griffiths (Botany), T. A. Grigliatti (Zoology), J. G. Hall (Pediatrics), R. E. W. Hancock (Microbiology), M. R. Hayden (Medical Genetics), F. B. Holl (Plant Science), D. G. Holm (Zoology), R. K. Humphries (Medicine), D. M. Juriloff (Medical Genetics), D. K. Kalousek (Pathology), D. G. Kilburn (Microbiology), G. Krystal (Pathology), J. Levy (Microbiology), R. T. A. MacGillivray (Biochemistry), W. R. McMaster (Medical Genetics), R. C. Miller (Microbiology), G. Namkoong (Forest Sciences), A. M. Rose (Medical Genetics), J. Schrader (Medicine), G. B. Spiegelman (Microbiology), F. Takei (Pathology), H. S. Teh (Microbiology), C. J. Walters (Fisheries/Zoology), G. Weeks (Microbiology), S. Wood (Medical Genetics).
Associate Professors: B. M. Alfred (Anthropology), J. T. Beatty (Microbiology), J. E. Carlson (Forest Sciences and Biotechnology Laboratory), K. M. Cheng (Animal Science), F. J. Dill (Medical Genetics), C. J. Douglas (Botany), M. J. Harris (Medical Genetics), G. Haughn (Botany), W. Jefferies (Medical Genetics and Biotechnology Laboratory), F. Jirik (Medicine), J. Kronstad (Biotechnology Laboratory, Microbiology, Plant Science), S. Langlois (Medical Genetics), B. C. McGillivray (Medical Genetics), D. Mager (Medical Genetics), D. G. Moerman (Zoology), R. Peterson (Animal Science), A. D. Sadowksi (Medical Genetics), J. Smit (Microbiology), F. Tufaro (Microbiology), J. Vielkind (Pathology), R. D. Wilson (Medical Genetics).
Assistant Professors: C. Brown (Medical Genetics), G. Dougherty (Pathology), L. Glass (Botany and Biotechnology Laboratory), D. Hogge (Medicine), P. Johnson (Microbiology), R. Kay (Medical Genetics), R. J. Redfield (Zoology), W. Robinson (Medical Genetics), I. J. Sadowksi (Biochemistry), T. Snutch (Biotechnology Laboratory).

Ph.D. and M.Sc. Degrees

Although there is no Department of Genetics at UBC, studies leading to the M.Sc. and Ph.D. degrees in Genetics are available. The Genetics Program is administered by the Advisory Committee on Genetics which is responsible to the Dean of the Faculty of Graduate Studies.

The Genetics Program is flexible, intended to accommodate the diverse background of students wishing to enter it, and also to take account of the broad nature of genetic research. Students who apply for entrance must satisfy the general regulations of the Faculty of Graduate Studies, and must be acceptable to the Genetics Admissions Committee and the Department in which they will work.

The student's graduate program will be decided upon by the student, the adviser, and the student's committee. The formal requirements in this regard, other than those set forth by the Faculty, are as follows. At some time during his or her academic program the student must take a course in each of introductory genetics, biochemistry, and statistics. If these have not been met satisfactorily in the student's undergraduate program, they must be included in the graduate program. In addition, all students will be required to take 18 credits of course work in their first year and a graduate seminar course (usually

Medical Genetics 540 or Biology 508). Each student proceeding towards a Ph.D. degree must pass an oral comprehensive examination within the first 18 months of study. All students are required to attend the Genetics Program Seminar regularly during all years of their registration in the Program. All students are required to present a seminar upon completion of their program.

A student's committee for the M.Sc. degree will consist of a minimum of three members including one member of the Advisory Committee, and the student's committee for a Ph.D. degree will consist of a minimum of four members including one member of the Advisory Committee. The Advisory Committee will monitor the progress of all students in the Genetics program.

Additional information on the graduate program in Genetics can be obtained directly from the Chair of the Advisory Committee, or from the Dean of Graduate Studies.

The following undergraduate and graduate courses are offered in the field of Genetics:

ANSC 413	Advanced Animal Breeding
ANSC 414	Animal Breeding Applied to Natural Populations
ANSC 513	Quantitative Genetics
ANSC 514	Applications of Quantitative Genetics
BIOC 410	Nucleic Acids
BIOC 421	Recombinant DNA Techniques
BIOC 510	Nucleic Acids Structure and Function
BIOL 334	Fundamental Genetics
BIOL 335	Principles of Genetics
BIOL 337	Laboratory in Eukaryotic Genetics
BIOL 414	Evolution
BIOL 430	Evolutionary Morphogenesis
BIOL 431	Eukaryotic Developmental Genetics
BIOL 432	Advanced Problems in Animal Genetics
BIOL 434	Population Genetics
BIOL 436	Fundamentals of Cytogenetics
BIOL 437	Advanced Laboratory in Eukaryotic Genetics
BIOL 443	Plant Genetics
BIOL 508	Current Topics in Genetics
FRST 302	Forest Genetics
FRST 502	Studies in Forest Genetics
GENE 501	Graduate Survey of Genetic Research
GENE 502	Graduate Survey of Genetic Research
GENE 519	Masters Thesis
GENE 649	Ph.D. Thesis
MEDG 410	Immunogenetics
MEDG 419	Human Cytogenetics
MEDG 420	Human Biochemical and Molecular Genetics
MEDG 421	Biology and Genetics of Neoplasia
MEDG 434	Population Genetics
MEDG 440	Medical Genetics
MEDG 505	Genome Analysis
MEDG 510	Advanced Immunogenetics
MEDG 520	Advanced Human Molecular Genetics
MEDG 530	Advanced Human Genetics
MEDG 540	Seminar
MEDG 548	Directed Studies
MICB 408	Molecular Virology
MICB 409	Microbial Genetics and its Applications
MICB 503	Bacterial Cytology and Genetics
PLNT 413	Plant Breeding
PLNT 513	Advances in Plant Breeding
ZOOL 509	Advanced Animal Population and Quantitative Genetics
ZOOL 510	Development Genetics

Geography

Professor and Head: T. R. Oke.

Professors: T. J. Barnes, M. Church, D. Gregory, W. G. Hardwick, R. C. Harris, D. F. Ley, D. McClung, T. G. McGee, J. Robinson, A. H. Siemens, H. O. Slaymaker, G. C. Wynn.

Associate Professors: M. J. Bovis, D. Edgington, R. N. North, G. Pratt, D. G. Steyn.

Assistant Professors: P. Austin, K. Denike, G. Henry, D. Hiebert, B. Klinckenberg, I. McKendry, M. Reed.
Instructors: R. Copley, M. E. A. North.

Ph.D., M.A., and M.Sc. Degrees

The Department offers M.A., M.Sc. and Ph.D. degrees as follows:

- 1) Programs in Physical Geography have a strong natural science emphasis. They focus on physical and ecological systems at or close to the earth's surface, and the interaction of these systems with people. The major substantive specializations are: Biogeography (plant ecology; arctic environments); Climatology (air pollution meteorology; mesoscale modelling; urban climatology); GIS and remote sensing (accuracy, fractals, integrated systems); Geomorphology (alpine hydrology and geomorphology; avalanche prediction, hillslope geomorphology and mass movements; fluvial sediment transport and the interpretation of river channel changes in B.C.); Hydrology (surface water, snow and land use hydrology; sediment yield and quality; energy and mass balance studies in the Coast Mountains and Lower Fraser Valley of B.C.). The Department co-sponsors (with Oceanography) a program in Atmospheric Science, which emphasises surface- and boundary-layer processes, mesoscale dynamics, atmosphere-ocean interactions, cloud physics, and air quality.
- 2) Programs in Human Geography are more pluralistic. Many projects explore the connections between human geography and political economy, social theory and cultural studies and pursue their substantive implications for interpreting changes in past and present landscapes. Other work focuses on the political and policy aspects of these changes (especially in North America and Asia). Major areas of specialization are: Economic Geography (Marxist and post-Marxist theories of the space-economy; analytical modelling; development theory; industrial restructuring and technological change); Feminist Geography (gender, sexuality and geography); Historical Geography (environmental history, colonialism and imperialism, urbanization, with a particular focus on North America (especially Canada), Europe, Latin America and the British Empire); Social and Cultural geography (theories of modernity and postmodernity; popular culture and the geography of everyday life; ethnicity-race, class and gender; consumption, place and landscape). Work in these fields often feeds into a strong general interest in Urban Geography (urban systems, urban growth and restructuring, social and economic change, with a particular focus on North America and Asia) and intersects with work in Environmental Geography (environmental sustainability, environmental policy, community development).
- 3) Programs in Regional Geography focus upon the following regions: Canada (especially Western Canada); Asia and the Pacific Rim (especially China, Japan and Southeast Asia); Russia and Eastern Europe; and Latin America (especially Mexico and Ecuador).

The Department participates actively in many interdisciplinary programs: Polar and Alpine, Asian Studies, Community and Regional Planning, Comparative Literature, Hydrology, International Relations, Remote Sensing, Resource Management Science, Sustainable Development, Transportation Studies, Urban Studies, and Women's Studies. Field studies include ongoing projects in the W. Arctic and Cordilleran regions of Canada and special projects in Latin America and Asia.

A detailed Guide to Graduate Studies in Geography and a brochure describing the Atmospheric Science program are available from the Department.

Geological Engineering

Director: A. J. Sinclair (Professor, Geological Sciences).

Ph.D., M.A.Sc. and M.Eng. Degrees

Opportunities for graduate work in geological engineering are available at UBC, in the Geological Engineering Program. Most programs are based in the Department of Geological Sciences, but they may also be based in the Departments of Civil Engineering, Mining and Mineral Process Engineering or Geophysics and Astronomy. Entrance to a program leading to a graduate engineering degree in the earth sciences is open only to students with an appropriate undergraduate degree in engineering.

Students who wish to pursue geological engineering studies in the fields of mineralogy, petrology, geochemistry, sedimentology or stratigraphy, or in economic, marine, surficial, structural, or environmental geology should apply to the Department of Geological Sciences for admission into their graduate program.

Students who wish to pursue environmental and/or geotechnical studies should apply to the Department of Geological Sciences if their primary field of interest is terrain analysis, engineering geology including slope stability or groundwater hydrology. They should apply to the Department of Mining and Mineral Process Engineering if their primary field of interest is applied rock mechanics or the geotechnical aspects of mine design. They should apply to the Department of Civil Engineering if their primary interest is in soil mechanics or water resources or to the Department of Geophysics and Astronomy if their interest is in engineering geophysics.

Prospective applicants should consult the descriptions of graduate study in the pertinent departments. Lists of faculty members are included there. Students accepted in any of these departments must satisfy the usual graduate requirements of the department in which they are registered. Inter-disciplinary programs that involve courses from two or more of the associated departments (and from other departments) are encouraged and supported. The Board of Study for Geological Engineering (as described under the Faculty of Applied Science) will act in an advisory capacity for students involved in interdisciplinary studies.

Geological Sciences

Professor and Head: S. W. Kieffer.

Professors: R. M. Bustin, R. L. Chase, W. K. Fletcher,

C. I. Godwin, A. J. Sinclair, J. L. Smith, P. L. Smith.

Associate Professors: W. C. Barnes, T. H. Brown, R. J. Knight, J. K. Russell.

Assistant Professors: R. D. Beckie, G. M. Dipple, K. A. Grimm, L. A. Groat.

Instructor: C. A. Giovannella.

The department is well equipped for research and study. Facilities include: an automated VG solid-source mass spectrometer for U, Pb isotopes; CAMECA SX-50 electron microprobe; equipment for x-ray diffraction, including modern single-crystal camera and powder diffractometer; analytical geochemical equipment for atomic absorption, colorimetry, wet chemistry, chromatography, and spectrography; a physical properties laboratory; rock and

mineral preparation equipment; microscopes and photographic laboratories; scanning electron microscope; hydrogeology and paleontology laboratories with computer workstations; and machine shop. A microcomputer laboratory is available for student use and terminals connect to the UBC computing centre. Maps, books and periodicals are available in a large reading room. The Mineral Deposits Research Unit conducts industry-sponsored research within the department.

Co-operation with other earth science departments at UBC (notably Geophysics and Astronomy, Geography, Oceanography, Botany, Soil Science, Metals and Materials Engineering, Mining and Mineral Process Engineering, and Civil Engineering) enables students to take advantage of facilities, instruction and advice in neighbouring fields. Co-operation and support is also received from the B.C. Ministry of Energy Mines and Petroleum Resources, the Geological Survey of Canada, and the mining industry.

Vancouver, on the Pacific margin, is a centre for the Canadian mining industry. British Columbia offers exceptional opportunity for combined field and laboratory research. The Canadian Cordillera offer research opportunities in the petrology of intrusive and volcanic rocks of many kinds, and of metamorphic rocks of all grades; in structural studies of complex metamorphic terrains exposed in three dimension; in metalliferous deposits of varied genetic types; in mineral exploration methods; in mineralogy associated with many different environments; in complexly folded and faulted successions of bedded rocks in the mountain belts and plateaus, and in virtually undisturbed coal- and gas-bearing strata of the northeastern part of the province; in numerous problems of engineering and environmental geology related to water, slope stability, urban development, and natural geological hazards. The lakes, fjords, deltas, tidal flats, continental shelf and oceanic depths provide a wide range of aquatic environments for students interested in sedimentology, geochemistry, biostratigraphy, and geological oceanography.

Ph.D. Degree

Courses in Geology and related fields will be selected in consultation with the candidate's committee.

M.Sc. (with thesis) and M.A.Sc. Degree

Courses include thesis and 18 credits in graduate or advanced courses in geology and related fields selected in consultation with the candidate's committee.

M.Sc. (without thesis) Degrees

Courses include 30 credits in graduate or advanced courses in geology and related subjects and a major paper, selected in consultation with the candidate's committee.

Geophysics and Astronomy

Professor and Head: R. M. Ellis.

Honorary Professors: T. K. Menon, R. Doncaster Russell,

W. F. Slawson, T. Watanabe, A. B. Underhill.

Professors: J. R. Auman, G. K. C. Clarke, R. M. Clowes,

G. G. Fahlman, D. W. Oldenburg, H. B. Richer,

D. W. Strangway, T. J. Ulrych, G. A. H. Walker.

Associate Professor: P. Hickson.

Assistant Professors: M. G. Bostock, B. A. Buffett, R. J. Knight, M. J. Yedlin.

Associate Member: B. Shizgal (Chemistry).

An outline of the research and facilities available follows:

Astronomy

The department offers opportunities for advanced study and research covering most areas of modern astronomy. Both observational and theoretical studies are supported.

Research programs at optical wavelengths of current interest include photometric studies of stellar populations in the Milky Way and in external galaxies with particular emphasis on globular clusters, photometric and spectroscopic studies of distant galaxies and active galactic nuclei, precise radial velocity studies of nearby stars to detect planetary companions, time-resolved spectroscopy of variable stars and active binary star systems. At radio wavelengths, studies of the thermal and non-thermal radiation from galaxies, quasars and related active extragalactic objects are being pursued.

Much of the observational work at optical wavelengths is supported by a continuing program of instrumentation development. Several low-light-level electronic detector systems have been constructed and are in use at the Dominion Astrophysical Observatory and the Canada-France-Hawaii Telescope. Advanced instrumentation development is supported by Astronomical electronics laboratories, a departmental machine shop and the use of the UBC 40 cm telescope as a test facility. Current efforts are directed toward the development of large two-dimensional detectors for both wide field photometry and spectroscopy, and large telescopes for cosmological surveys.

In addition to theoretical studies related to the observational programs, research on the structure and dynamics of both hot and cool stellar atmospheres is being actively pursued. Studies related to the dynamics of planetary exospheres, the interplanetary medium and the interstellar medium can also be supported.

The department provides a UNIX network of workstations built around a SUN-1/670 server. Major software packages are available for the analysis of one and two-dimensional spectroscopic data, wide field photometric data of stellar fields and extended objects, and for radio data obtained at the Very Large Array.

The 3.6m Canada-France-Hawaii Telescope is regularly used for departmental research programs. Time is also available on the 1.2 m and 1.8 m telescopes of the Dominion Astrophysical Observatory.

Geophysics

The department offers theoretically and experimentally oriented M.Sc., M.A.Sc. and Ph.D. programs in a number of key areas of geophysics. Current fields of interest in the department are: glaciology with studies in glacier physics, till physics and avalanche research; rock physics, in particular, experimental investigations of the electrical and acoustic properties of porous media; geodynamics with emphasis on planetary rotation and physics of the core and lower mantle; time series and inversion studies with applications to seismic processing, mineral exploration and environmental studies; geophysical instrumentation with emphasis on magnetometer development and detection of seismoelectric phenomena; seismology with observational programs in crustal studies, both reflection and refraction, and earthquake studies focussed on understanding the past and current tectonic processes in western Canada, and theoretical and model studies to investigate propagation in laterally inhomogeneous media; and analysis and interpretation of potential field data.

Specialized facilities and instrumentation include: an 840 MHz radar system for airborne ice sounding; pulse EKKO IV ground penetrating radar unit for shallow geophysical/

environmental investigations; 12 short period digital seis-mographs; eight three-component broadband digital seis-mographs; a six-element seismic array; an integrated MICROVAX and SUN workstation processing facility with interactive seismic reflection processing software and color plotting capability.

Ph.D., M.Sc., and M.A.Sc. Degrees

Candidates are expected to have the equivalent of an Honours Degree in Science or Engineering, with a firm background of mathematics and physics up to fourth-year level. While some undergraduate instruction in geophysics or geology is an advantage, it is not a prerequisite for entry into graduate programs of the Department. Geophysics students who have not completed a course in physics of the earth at either the senior undergraduate or graduate level will be required to register for Geophysics 426.

The 12-credit M.Sc. thesis is normal in the Department. For the M.Sc. in either Geophysics or Astronomy a minimum of three credits of graduate course work taken outside of the Department is required. Appropriate choice(s) of outside course(s) is made in consultation with the graduate adviser.

A leaflet giving further details of the degree programs and the availability of financial support for students is available from the Department.

Complete course descriptions are in the Courses of Instruction section of the *Calendar*.

Germanic Studies

Professor and Head: E. Mornin.
Professors: K. Petersen, P. Stenberg.
Associate Professors: K. Zaenker, T. Salumets.
Assistant Professors: R. Beaumont, J. Roche, S. Taubenbeck.

Ph.D. and M.A. Degrees

The Department of Germanic Studies offers courses leading to the degree of M.A. (with or without thesis) and Ph.D. The courses and seminars are normally given either every year or every second year. For details concerning these courses and for information on specific requirements for graduate degrees, application should be made to the Graduate Adviser of the Department of Germanic Studies.

The resources of the University library are adequate for research in all fields of German literature and are particularly strong in the mediaeval and the nineteenth and twentieth century areas. Funds are available for the acquisition of materials in areas in which graduate students develop specific interest. To complement library resources, the Department maintains a reading room for graduate students, in which reference works, editions of standard authors, and some periodicals are kept.

Gerontology

Faculty members in various disciplines and professions on campus have a particular interest in the study of aging and the aged. Gerontological concerns are diverse and multifaceted. Basic and applied age-related research is also conducted in several departments and professional schools.

Although UBC does not offer a Graduate Degree in Gerontology per se, the following Schools, Departments and Faculties may provide educational opportunities at the graduate level in Gerontology: Anthropology-Sociology,

Architecture, Community and Regional Planning, Counselling Psychology, Dentistry, Economics, Educational Studies, Family and Nutritional Sciences, Family Practice, Geriatric Medicine, Health Care and Epidemiology, Law, Librarianship, Nursing, Pharmaceutical Sciences, Psychology, Physical Education and Recreation, Rehabilitation Sciences, Social Work, Sociology. In addition, the Institute of Health Promotion Research coordinates activities in this area.

Students will be expected to satisfy the general entrance regulations of the Faculty of Graduate Studies and specific requirements of the appropriate department. Enquiries should be directed to the appropriate department or to the Assistant Director of the Institute of Health Promotion Research.

See also Interdisciplinary Studies.

Greek

M.A. and Ph.D. Degrees

See Classics.

Normally, the Ph.D. thesis will be written on a Greek subject and the degree will be taken in Classics.

Green College

Principal: R. V. Ericson (Anthropology and Sociology, Law).

Green College is a centre for advanced interdisciplinary scholarship at the University of British Columbia. It is home to a community of scholars who blend social and intellectual life through living together, academic programs, dining and cultural events. The programming includes eight interdisciplinary groups, the Cecil and Ida Green Visiting Professorships series, a residents speakers series, a faculty speakers series, special seminars and workshops, research projects and a performing arts group. Most activities occur before and after dinner, and they attract people from all parts of the campus and from the wider community to share in advanced intellectual discussion and to dine with members.

The College provides accommodation for 85 graduate students, 15 senior scholars and five visitors on a unique site at the north end of the UBC campus, looking out towards English Bay and the mountains beyond. Graduate students are chosen on the basis of academic standing, commitment to participation in the life of the College, and the need to achieve a mix of students which reflects the general graduate student population. They are normally permitted to live in Green College for no more than two years, after which they may become non-resident members. Non-resident members are also selected from the graduate student population, community, the alumni and the faculty. The visitor suites within the College are available for distinguished visitors, who are expected to interact with the College community during their periods of residence.

In addition to living accommodation, the College has seminar rooms, recreation facilities, dining and social facilities, a reading room, and administrative offices. The focal point of the College is Graham House, which has been restored to its original (1912) form and which contains the dining hall, reading room and social activities. All residents are expected to have five dinners together each week.

Health Care and Epidemiology

Professor and Head: S. Sheps.
Professors: M. Barer, L. Green, R. G. Mathias, B. J. Morrison, M. Schechter.
Associate Professors: C. Hertzman, A. Kazanjian, S. Kennedy, R. E. Modrow, J. Tan, K. Teschke, C. van Netten.
Assistant Professors: P. Demers, R. Hanvelt, R. Hogg, S. Marion, J. Rabouad, J. Singer.
Research Associates: S. Strathdee.

M.H.A. Degree

The Graduate Program in Health Administration is designed to provide the educational and professional foundations that are necessary for those aspiring to management and leadership positions in the health care field. The Program emphasizes analytical thinking through a generic curriculum rather than narrow areas of specialization. Flexibility is provided for students who wish to pursue individual interests through elective coursework, clerkship and management projects.

Two academic years of formal course work are required as well as a three month clerkship following the completion of all required first year courses. A Master of Health Administration (M.H.A.) degree is awarded after successful completion of 57 credits of course work.

This program is accredited by the Accrediting Commission on Education for Health Services Administration.

Application deadline is March 31.

M.H.Sc. Degree

The Master of Health Science (M.H.Sc.) Program is designed to provide graduate education for physicians in the areas of Clinical Epidemiology, Occupational Health or Community Health. Minimum admission requirements for this 30 credit program include an academic record that meets Faculty of Graduate Studies requirements and an M.D. or equivalent degree.

All application materials must be received by March 31.

M.Sc. and Ph.D. Degrees

The Department offers research-oriented graduate programs leading to the M.Sc. and Ph.D. degrees, both with thesis. These may be focussed on any of the areas of strength of the faculty, with particular examples being clinical epidemiology, community health, health services management and planning, health care policy, occupational and environmental health, and preventive medicine and health promotion. The minimum requirement for an M.Sc. degree (including thesis) is 30 credits. However the actual courses required are at the discretion of program supervisors and often the number of credits required is 36 to 42. For Ph.D. students the requirements are more flexible in that courses required will be defined by students and their Ph.D. Committee. Individuals with a basic degree in the health or related sciences will be considered eligible to apply for admission, but the number of positions is limited. The department's graduate adviser should be contacted for further information. Application deadline is March 31.

Health Promotion Research, Institute of

Professor and Director: L. W. Green.
Assistant Director: C. J. Frankish
Director of Life Skills Motivation Centre: R. Hansen.

In 1990 The University of British Columbia established an Institute of Health Promotion Research to meet the challenges of improving health and quality of life. This institute provides multi-sectoral collaboration and service in the field of health promotion. Departments, Schools and Faculties currently associated with the Institute are: Adult Education; Anatomy; Anthropology and Sociology; Audiology and Speech Sciences, Centre for Health Services and Policy Research; Centre for Human Settlements; Commerce; Community and Regional Planning; Counseling Psychology; Dentistry; Economics; Family and Nutritional Sciences; Family Practice; Health Care and Epidemiology; Human Kinetics; Medicine; Nursing; Paediatrics; Pharmaceutical Sciences; Psychology; Rehabilitation Sciences; Social Work; Sports Medicine; and Statistics.

Health is increasingly recognized as a basic resource, and health promotion as a process that encourages personal empowerment and public responsibility. With its strong linkages to the behavioural, biomedical, educational, environmental and social disciplines, this broadly-based institute seeks to bring the University's research and educational programs more closely in line with current views on health.

Students may enroll through the individual Interdisciplinary Studies route, by establishing individual programs under the guidance of a multi-departmental faculty committee. The Institute currently facilitates applications only at the Ph.D. level, seeking applicants with at least a masters degree in one of the disciplines represented by the Departments, Schools and Faculties listed above as associated with the Institute of Health Promotion Research.

For more information contact C. James Frankish, Assistant Director, IHPR, 6248 Biological Sciences Road, The University of British Columbia, Vancouver, B.C. V6T 1Z4; telephone (604) 822-2258, fax (604) 822-9210.

Hearing Accessibility Research, Institute of (IHEAR)

Professor and Director: C. A. Laszlo

The Institute was established in 1994 with the mission to develop research, training, education, and service in the field of hearing accessibility. In pursuing this mission, the Institute coordinates the activities of scientists, professionals, manufacturers, and consumers to examine the problems facing hard of hearing people, to find appropriate solutions to these problems, and to promote hearing accessibility. One of the most important tasks of the Institute is to gather, evaluate, and disseminate information related to the field.

The Institute will serve the needs and interests of the hard of hearing — people with hearing loss (from mild to profound) who nevertheless communicate via speech and make use of whatever residual hearing they have left. Hard of hearing people, comprise about 7% of the general population and are by far the largest group of people with hearing disorders. Yet the condition itself, and the varied and complex needs of hard of hearing people, are poorly understood.

The areas of activity include hearing accessibility issues in the home, in the educational setting, at the workplace, in the health care setting, and in the rehabilitation of the hard of hearing elderly. Psycho-social issues associated with hearing accessibility and hard of hearing people, the effect of the acoustical environment, hearing aids and

assistive listening devices, and physiological and medical issues are also of major interest.

The disciplines involved in these activities include Anthropology, Architecture, Audiology, Educational Psychology, Electrical Engineering, Health Promotion, Law, Mechanical Engineering, Occupational Hygiene, Otolaryngology, Psychology, Sociology, Special Education, and Speech Sciences.

The Associates of the Institute are professors in various Departments and Faculties of the University, Practicing professionals in the community and hard of hearing consumers who are actively participating in the work of the Institute can become Affiliates. Professionals have the opportunity to propose and to participate in projects, and to pursue their own research interests. Consumers participate in the setting of research and program goals, work on specific projects, participate in community out-reach, or raise funds. A number of seats on the Advisory Committee of the Institute are reserved for professional and hard of hearing consumer organizations.

For further information contact Dr. Charles A. Laszlo, Director, IHEAR, 2356 Main Mall, UBC, Vancouver, B.C. V6T 1Z4; telephone: (604) 822-3956, fax: (604) 822-5949, e-mail: laszlo@ee.ubc.ca, DISC: claszlo.

Hispanic and Italian Studies

Professor and Head: M. Chiarenza (Italian).
Professors: S. Ciccone (Italian), R. M. Flores (Spanish), A. Pacheco (Spanish), A. Urrello (Spanish).
Associate Professors: D. C. Carr (Spanish), M. G. R. Cooper (Spanish), J. Rubio (Spanish), M. Tomsich (Spanish).
Assistant Professors: D. Boccassini (Italian), C. Testa (Italian).

Ph.D. and M.A. Degrees

The Department offers graduate programs leading to the M.A. degree with or without thesis, and to the Ph.D. The M.A. degree may be taken in Italian Literature, or in Spanish Peninsular Literature or Spanish-American Literature. The Ph.D. is offered in Spanish Peninsular and Spanish-American Literature.

The University Library has extensive holdings in Italian and in all Hispanic areas, especially in periodicals and Latin-American Studies, both Spanish and Portuguese. There is also a Departmental reading room for Graduate Students, containing basic texts, scholarly collections and reference works.

A detailed brochure describing the graduate programs is available on application to the Graduate Adviser of the Department of Hispanic and Italian Studies.

History

Professor and Head: W. P. Ward.
Professors: D. Breen, L. E. Hill, R. V. Kubicek, D. Lary, A. J. Ray, A. A. Sinel, R. W. Unger, A. Woodside.
Associate Professors: R. Barman, G. W. Egerton, C. Friedrichs, C. W. Humphries, E. J. Hundert, P. N. Moogk, D. Newell, A. G. L. Smith, C. W. Stocker, W. A. Tully, W. Wray.
Assistant Professors: J. Dixon, W. E. French, A. Gorsuch, J. P. Huzel, P. Krause, S. Lee, R. McDonald, G. Peterson, S. M. Straker.

Ph.D. and M.A. Degrees

The Department offers M.A. and Ph.D. programs, each requiring a thesis, in the fields of Canadian, Asian (Modern China and Japan), Western European (early modern and modern), British Imperial and Commonwealth, Inter-

national Relations, Native, American and Latin American History. At the Ph.D. level, the department stresses Canadian and Asian history. Within these areas the Faculty offers graduate reading courses and research seminars in the main varieties of political, diplomatic, economic, social and intellectual history. Research in all these fields is facilitated by large library holdings on microform, including government publications, state papers, newspapers and very extensive collections of early modern pamphlets and literature. There are notable collections of books in the history of the American West, of Canada (one of the best in Canada, with especially large sections on British Columbia and the Prairie West), international relations, Germany (the best in Canada), radical movements in Europe and North America, medicine, science and technology (The Woodward Library), and East Asia (especially Modern Chinese and Japanese business history). A detailed brochure describing the Department's programs for the Ph.D. and M.A. degrees is available upon application.

Human Kinetics

Professor and Director: R. W. Schutz.
Professors: A. N. Belcastro, D. B. Clement, D. C. McKenzie, I. M. Franks, J. E. Taunton, P. Vertinsky.
Associate Professors: F. A. Carre, K. D. Coutts, M. Luke, A. Martin, R. E. Mosher, E. C. R. Rhodes, D. J. Sanderson, G. D. Sinclair.
Assistant Professors: S. A. Bleuler, A. Dewar, W. Frisby, R. E. C. Sparks.

Ph.D. Degree

The program is governed by the general requirements for the Ph.D. degree as laid out by the Faculty of Graduate Studies. In addition, a thesis-based Master's degree in Human Kinetics, Physical Education, Kinesiology, or other related fields of study, along with appropriate undergraduate and graduate courses are required for admission to the program. Applicants with an undergraduate or graduate degree in other than Human Kinetics will be considered for admission, particularly if they have had a strong relationship to Human Kinetics. The student's thesis committee, in accordance with the policy of the Faculty of Graduate Studies, will recommend a program to provide a strong background, appropriate research skills and a specialization in the chosen field of study, and set a two-part comprehensive examination after completion of the course work. Following the comprehensive examination, the student will present a formal thesis proposal for approval by the candidate's committee before proceeding to the research.

Potential candidates should contact the Graduate Adviser, School of Human Kinetics, for application forms and an information brochure which describes the required supporting documentation (letters of reference, statement of research interest).

M.Sc., M.A. and M.H.K. Degrees

The School of Human Kinetics offers opportunities for original investigations (M.A. and M.Sc.) and advanced study (M.H.K.) in basic and applied physical education in the biological, behavioural, and socio-managerial areas. Excellent research and teaching venues are located on campus with support from provincial and national agencies. The resources located within Human Kinetics include a centralized computer facility and Laboratories of Biomechanics, Cell Physiology and Exercise, Motor Control and Behaviour, Physiology of Exercise (Allan McGavin Sport Medicine Clinic and Buchanan Aquatic Centre),

Leisure Studies, Performance and Instructional Analysis, and a Centre for Sport Analysis.

Admission requirements: Students entering the M.A. program will be expected to have a background in arts or management whereas students entering the M.Sc. program will be expected to have a background in the sciences. Students entering the M.H.K. program must have a B.H.K. degree or its equivalent. Admission to all programs requires a First Class standing (80% or above) in at least 12 credits of work relevant to the chosen program of study, and at least an upper Second Class standing (74% or above) in the remaining course work in the Third and Fourth Year level.

Degree opportunities at the Master's level must be completed with 36 credits of study, to be arranged by the student in consultation with his or her assigned Faculty Adviser. Students selecting a program with thesis (M.A. or M.Sc.) will be required to complete 12 credits of research on a topic to be arrived at in consultation with their assigned Faculty Adviser and thesis supervisory committee.

Human Nutrition

School of Family and Nutritional Sciences

Professor and Acting Director: M. Arcus.
Professors: L. D. Desai, J. Leichter.
Associate Professor: S. L. Barr.
Assistant Professors: G. Chapman, L. McCargar.
Senior Instructor: C. Daem.
Lecturer from Other Department: S. M. Innis, Associate Professor of Paediatrics.

The Division of Human Nutrition of the School of Family and Nutritional Sciences offers opportunities for advanced study and original investigations in basic and applied human nutrition, and in selected aspects of clinical and community nutrition. The curriculum includes course work and thesis research through laboratory or field work.

Excellent research and teaching laboratories are located in a building completed in 1982. These include modern instruments for automated biochemical analyses, radioisotope tracer studies, atomic absorption spectrophotometry, and other routine laboratory procedures relevant to nutritional investigation. Facilities for small animals (rats, mice, etc.) are available. There are excellent computer facilities.

Opportunities are offered at both the Master's and Doctoral level for research in topics such as: 1) Nutrition and physical activity; 2) International nutrition; 3) Food habits and nutritional status of migrants in Brazil; 4) Pre- and postnatal mammalian development of lipid and carbohydrate metabolism; 5) Carnitine metabolism; 6) Energy expenditure and body composition in infants and adults; 7) Maternal nutrition and fetal development; 8) Trace mineral metabolism; 9) Alcohol and nutrient bioavailability; 10) Fetal alcohol syndrome; 11) Nutrition and disease such as obesity and diabetes, and other topics of interest to students and faculty members.

M.Sc. Program

For admission with full standing the candidate must hold a Bachelor's degree in Nutrition, Dietetics or Foods, Biological or Chemical Sciences, Agriculture Sciences, Health Sciences or a related field, with First Class (80% or above) standing in at least two courses (12 credits) relevant to Human Nutrition, and at least 68 to 79% standing in the remaining third and fourth year courses relevant to

Human Nutrition. Students entering the graduate program in Human Nutrition are expected to have on their record recent courses in biochemistry with laboratory, physiology, and advanced nutrition. Students deficient in one of these areas will be required to take the appropriate courses early in the graduate program. Applicants deficient in more than one area will have to complete a qualifying year as unclassified students before they can be considered for admission to the graduate program.

Ph.D. Program

Applicants will be expected to a) hold a Master's degree in nutrition or in a closely related discipline or b) have completed the first year of the M.Sc. program in Human Nutrition at UBC with 18 credits of First Class Average, of which at least 10 credits must be at the 500 level or above and at least 10 credits must be of First Class standing, or c) have a Bachelor's degree with First Class Honours in Nutrition, or a closely related discipline. Applicants lacking some relevant undergraduate courses may be required to complete those courses early in the program or in a qualifying year prior to admission into the Ph.D. program.

Courses in Human Nutrition are listed in the course offerings of the School of Family and Nutritional Sciences.

Human Settlements, Centre for

Professor and Director: A. Laquian.

The UBC Centre for Human Settlements (CHS) was established following the 1976 United Nations Conference on Human Settlements held in Vancouver. The interest generated by the Habitat Conference led to the formation of a multi-disciplinary research centre within UBC's Faculty of Graduate Studies.

The Centre is part of UBC's School of Community and Regional Planning and reports to a governing council. The faculty members who comprise the CHS Council are from university departments and institutes with interests relating to human settlements. Both the Centre and the School report to the Dean of the Faculty of Graduate Studies.

The aim of the Centre for Human Settlements is to undertake multi-disciplinary research and disseminate information on issues relating to housing, urban and regional development, urban governance, and community development planning. The Centre seeks to engage in policy-relevant research which will help communities build socially and economically stronger and physically more pleasant and efficient human settlements.

CHS research is aimed at identifying, studying and promoting processes by which communities can effectively shape and continually improve their own initiatives. The focus is on developing community-level interaction, identity, institutions and initiatives. The role of senior governments is addressed in terms of identifying what government can do to assist communities in their own development. The Centre also seeks to identify lessons which can be shared within and between industrialized and non-industrialized areas of the world.

Research is focused on the following geographic areas: Canada, with a particular emphasis on British Columbia and northern Canada, China, Indonesia, Vietnam and Thailand, and the Pacific Rim countries in general, as part of UBC's leading role in the region. CHS also responds to requests for research work in other areas of the world where CHS staff and UBC faculty have expertise. In 1990,

CHS was named a CIDA "Centre of Excellence" in human settlements planning. With a CIDA grant of \$5.8 million over five years, CHS is developing a new stream in human settlements planning at SCARP and is conducting action-research projects in China, Indonesia and Thailand.

Hydrology

Opportunities are available for graduate work in hydrology in a variety of programs. Individual courses pertaining to hydrology are available in the Departments of Bio-Resource Engineering, Civil Engineering, Geography, Geological Science, Oceanography, Soil Science, and the Faculty of Forestry. Supervision of advanced work in various aspects of hydrology can be undertaken within these disciplines.

Students seeking admission to the interdisciplinary Ph.D. program in hydrology should apply directly to the Dean of Graduate Studies. A committee of faculty members knowledgeable in areas of particular interest to the applicant and representing at least three different disciplines will be convened by the Coordinator of the Interdisciplinary Hydrology Program. Criteria to be used when considering an applicant for the interdisciplinary program will include the appropriateness of undergraduate course background.

The following is a suggested guide:

- 1) Mathematics, up to and including Differential Equations (e.g., UBC, equivalent is Mathematics 315)
- 2) Inferential Statistics, (e.g., Statistics 205)
- 3) Physics of Fluid Flow, (e.g., Civil Engineering 215)
- 4) Introduction to Meteorology and Climatology (e.g., Geography 300, 301, 302, 303, Physics 421 or Soil Science 414)
- 5) Introduction to Surface Water Hydrology (e.g., Civil Engineering 418, Forestry 385 or Geography 205)
- 6) Introduction to Subsurface Hydrology (e.g., Geology 342 or Soil Science 413)

At least six credits from the following list of graduate courses are required as part of the Ph.D. program:

Bio-Resource Engineering 560, 561, 562
Civil Engineering 516, 551, 554, 556
Forestry 585, 589
Geography 502, 503, 504, 509, 526
Geological Sciences 562, 564, 565, 566
Oceanography 518, 526
Soil Science 501, 513, 514, 524, 533

Individual Interdisciplinary Programs

See Interdisciplinary Studies below.

Industrial Relations

Graduate study in various aspects of Industrial Relations may be undertaken in the Departments of Anthropology and Sociology, Economics, History, and Psychology in the Faculty of Arts, and in the Faculties of Commerce and Law. The Faculty of Commerce offers a Master of Science degree with a specialization in Industrial Relations and has an Industrial Relations Committee to co-ordinate activities within that Faculty. Prospective students should contact any of the departments or faculties listed above for further information on programs of study.

International Relations, Institute of

Director: B. L. Job.
Professor: M. W. Zacher.

The Institute of International Relations is a research institute within the Faculty of Graduate Studies at the University of British Columbia. Its purpose is to facilitate internationally-oriented, interdisciplinary research and curricula among the faculty and students of UBC and other institutions. The Institute administers projects and grants, organizes conferences, sponsors seminars and lectures, and hosts postdoctoral fellows and visiting scholars. The Institute of International Relations at UBC is one of the longest standing of its kind within Canada.

Faculty from a wide range of disciplines, including political science, law, commerce, history, economics, and other social sciences, are involved in the Institute's activities. The Institute collaborates with other campus units that have overlapping interests in international issues, such as the Centre for International Business Studies and the Institute of Asian Research. In addition, it has developed links with institutions in Canada and abroad.

The major research projects within the Institute at present focus on the transformation of the international system in the post-Cold War era; on Canada's role in the international order; on the formation of international regimes to manage global issues, including the environment; on North/South relations; and on international security, especially Asia-Pacific security.

The Institute sponsors conferences and lecture series; it does not offer courses or degree programs. Inquiries concerning graduate studies in international relations should be directed to the Department of Political Studies and the Faculty of Graduate Studies.

Interdisciplinary Studies

Director: L. Ricou.

M.A., M.Sc. and Ph.D. Degrees

The Faculty of Graduate Studies encourages the realignment of traditional disciplines into new patterns, and crossing departmental and faculty boundaries to foster the development of new areas of learning.

In some cases, an interdisciplinary area has been authorized to offer and administer formal degree programs (Advanced Technology Management, Comparative Literature, Genetics, Neuroscience, Occupational Hygiene, Resource Management and Environmental Studies). In other cases, students find that degree programs in existing departments or faculties are either inherently interdisciplinary, or flexible enough to accommodate interdisciplinary research projects. A major function of the various centres and institutes of the Faculty of Graduate Studies (see entries in this section of the *Calendar*) is to promote interdisciplinary research; the associated inter-departmental or inter-faculty groupings are commonly willing to guide students in setting up interdisciplinary programs.

Where no established degree program exists, a student may request admission into a special individual interdisciplinary program administered by an ad hoc committee representing the various disciplines involved. Research topics in this program have included, for example,

- Japanese Noh Drama (involving Asian Studies, Fine Arts, Theatre and Anthropology)

- Problem-Solving Dreams (involving Counselling Psychology, Psychology, Anthropology and Nursing)
- Hearing Impairment and Deviant Behaviour (involving Sociology, Educational Psychology and Health Care and Epidemiology)
- Cardiorespiratory Physical Therapy (involving Physiology, Pathology, Rehabilitation Sciences and Human Kinetics)
- Information Technology in Factory Automation (involving Computer Science, Chemical Engineering, Geography, Sociology and Commerce)
- Modernity in American Fiction and Painting (involving English, Fine Arts and Sociology)
- The Consumer Society and Political Culture (involving Political Science, Sociology, Commerce and Human Kinetics).

Application for admission to Interdisciplinary Studies requires, in addition to the usual transcripts and letters of reference, submission of a proposal for an interdisciplinary thesis, and the support of a cross-departmental group of UBC faculty. Full details of the process, including a helpful brochure giving step-by-step procedures, are available from Interdisciplinary Studies, Faculty of Graduate Studies.

Italian

See Hispanic and Italian Studies.

Japanese Research, Centre for

Executive Committee: K. Nagatani (Economics, Chair),
D. Edgington (Geography), J. Mostow (Asian Studies),
S. Salzberg (Law), K. Tsuruta (Asian Studies).

See Asian Research, Institute of.

Korean Research, Centre for

Executive Committee: Y. Chang (Anthropology and Sociology,
Chair), G. Namkoong (Forest Sciences), T. Oum
(Commerce and Business Administration), K. A. Park
(Political Science), I. Verrinsky (Commerce and Business
Administration).

See Asian Research, Institute of.

Landscape Architecture

Associate Professor and Director: P. Condon,
Associate Professor: P. Mooney, D. D. Paterson, M. Quayle.

M.L.A. Degree

To fulfill the requirements of the degree of Master of Landscape Architecture, the student must complete a 30-credit program. Part-time study is allowed with the approval of the Landscape Architecture Graduate Program Committee. Full-time students normally complete this program within two academic years.

The degree is designed for those who have a professional degree in landscape architecture, or a related design discipline, and have some experience in a design practice. Consult the Landscape Architecture Program for detailed application requirements such as portfolio and statement of intent. This post-professional program is not intended

to fulfill the requirements for membership as established by the British Columbia Society of Landscape Architects or similar organizations in other provinces of Canada.

Course of Study

This program allows the student to investigate an area of knowledge within the broad field of landscape architecture in collaboration with faculty who may be engaged in research or consulting activity in that area. The research project is expected to synthesize existing knowledge in landscape architecture and related fields to produce a new understanding in the field. The synthesis may result in a creative work and/or written report. The course of study is comprised of LARC 500 (0); Seminar: LARC 520 (3); Advanced Design Methods and Theories: LARC 540 (3); Environmental Analysis for Site Planning: LARC 599 (12); Thesis: 500-level electives (6); and, 300-level and above electives (6).

Entering students will be required to work out a course of study with an adviser for approval by the Graduate Program Committee using the Guidelines provided. Make-up courses may be required beyond the total number of units normally prescribed for the degree, particularly for candidates from design disciplines other than landscape architecture. At least one statistics course is a prerequisite for applicants.

Area of Study

Research activities and thesis development will be focused within the two broad areas of:

- Design Theory and Design Education
- Environmental Planning and Management at the Site Specific Scale

Language Education

Professor and Head: V. Froese.

Ph.D., Ed.D., M.A. and M.Ed. Degrees

Language Education (LANE) offers courses as well as M.Ed. and M.A. degrees under the headings of English Education (ENED), Reading Education (READ), Modern Language Education (MLEE), and Teacher Librarianship (TLIB). It offers an Ed.D. in Reading Education (READ) and a Ph.D. in Curriculum and Instruction with a focus in the department's areas of specialization.

The Department of Language Education is one of the largest of its kind in North America in that it includes scholars in a comprehensive range of language education related fields. These fields relate to the teaching of:

- English Language Arts—literature, composition, drama, poetry, oral language.
- English as a Second Language -- TESL methods, applied linguistics, UBC/Ritsumeikan Joint Academic Exchange Program.
- Reading — emergent literacy, developmental reading, clinical methods, content areas, adult literacy.
- Teacher Librarianship — cooperative program planning, school library organization and management, school library automation, and
- Modern Languages — French Immersion, French as a First and Second Language, Asia Pacific language and curriculum study, and other modern languages.

The Department of Language Education is committed to excellence in scholarship, teaching, and professional leadership and is responsive to Canada's multicultural, multi-lingual context. Its goal is to advance the study of lan-

guage learning, and the teaching and learning of language, literacy, and literature in their broadest frames of reference.

Graduate courses in research in the various subject matter fields as well as departmental doctoral seminars are offered on a rotating basis. Department members are actively involved with graduate students in local, provincial, national and international research. A complete listing of individual faculty research interests may be found in the LANE Handbook on Graduate Admissions, Program Planning and Supervision, which is available upon request. While part-time students are accepted, preference is given to full-time students in M.A. and doctoral programs. A limited number of Teaching Assistantships and Research Assistantships are available to exceptionally qualified students.

The Department of Language Education operates a state-of-the-art computer integrated language laboratory in UBC/Ritsumeikan House, and a Language Education Research Centre, in Ponderosa Annex F, with multi-media facilities, special book collections, and language education curriculum materials. Video production facilities are also available for faculty and graduate students.

For further information, please contact: Department of Language Education, Faculty of Education, 2125 Main Mall, Vancouver, B.C., V6T 1Z4; telephone (604) 822-5788, fax (604) 822-3154.

Latin

M.A. and Ph.D. Degrees

See Classics.

Normally, the Ph.D. thesis will be written on a Latin subject and the degree will be taken in Classics.

Law

Professor and Dean: C. L. Smith.

Professors: J. J. Atrens, J. Blom, C. Boyle, P. T. Burns,

R. M. Elliot, K. B. Farquhar, I. Head, M. A. Hickling,

J. Hogarth, M. A. Jackson, M. T. MacCrimmon,

D. J. MacDougall, J. M. MacIntyre, A. J. McClean,

R. K. Paterson, D. J. Pavlich, D. E. Sanders, A. F. Sheppard,

J. C. Smith, E. C. E. Todd, J. M. P. Weiler.

Associate Professors: J. C. Bakan, W. W. Black, P. L. Byden,

B. R. Cheffins, D. S. Cohen, E. R. Edinger, R. T. Franson,

I. Grant, P. B. Potter, R. S. Reid, B. V. Slutsky, J. Townsend-Gault, S. M. Wexler, C. F. L. Young.

Assistant Professors: J. Borrows, R. D. Diebolt, R. W. Grant,

G. M. Green, N. Iyer, M. G. Kline, B. W. MacDougall,

K. Mickelson, J. Mosoff, S. Salzberg.

Chairs: S. Boyd, Chair in Feminist Legal Studies; W. Pue, Chair in Legal History.

Ph.D. Degree

The program provides advanced training for outstanding graduate students who have already obtained a Master of Laws (LL.M.) degree or equivalent. Through the program, highly accomplished graduate students will be trained to carry out advanced research under supervision by members of the Faculty of Law.

Admission

A candidate for admission to the Ph.D. program must have demonstrated the qualifications to conduct independent original research and analysis that make a scholarly contribution to the field of Law. The candidate must have a Masters of Law (LL.M.) degree or its equivalent from an approved institution in a field of specialization

that would support the applicant's Ph.D. research program. Admission decisions are based on the candidate's thesis proposal, letters of reference, and prior academic performance. A candidate's admission is not complete until the application has been accepted and the course of study has been approved by the Faculty of Law. Applicants who chose to demonstrate their English Proficiency by means of TOEFL will require a score of 600. See "English Language Proficiency Requirements".

Requirements of the Program

The Ph.D. program in law is administered by the Faculty of Law in conjunction with the Faculty of Graduate Studies. The requirements for the Ph.D. are:

- 1) Full-time residence at the University for a minimum of two academic years (September to May) although this period may be reduced to 12 consecutive months, pursuant to procedures of the Faculty of Graduate Studies.
- 2) Successful completion of the one-year, two-part Doctoral Seminars (Law 610 and 611 for four credits).
- 3) Passing of a Comprehensive Examination set by an Examination Committee comprised of the student's faculty supervisor and two other examiners selected by the supervisor in consultation with the student.
- 4) Completion of a doctoral thesis approved by a thesis reading committee comprised of the student's faculty supervisor, not fewer than two other members from the Faculty of Law, and a faculty member from a faculty other than Law who is also a holder of a doctoral degree. The thesis must be an original work of research and analysis that makes a scholarly contribution to the field of law.
- 5) An oral defense of the doctoral thesis.

Each student will have a faculty supervisor drawn from the Faculty of Law. The selection of faculty supervisors will be administered by the Graduate Committee of the Faculty of Law, subject to approval by the Dean of Law and the Dean of Graduate Studies.

LL.M. Degree

The program provides graduates with the opportunity for advanced legal education in preparation for law teaching, legal research, public service and the practice of law. It does not give entry to the British Columbia or other bar.

Admission

A candidate for admission to the LL.M. program must demonstrate qualifications necessary to permit engagement in creditable research in Law by possessing an adequate foundation and a capacity for superior performance. The candidate must have a Bachelor of Laws degree or its equivalent from an approved law school, and must have obtained an Honours (four-year) Bachelor of Laws degree with First Class standing ("A-" or better) in at least 12 credits of Third and Fourth year coursework, or a Bachelor of Laws (three-year) degree with First Class standing ("A-" or better) in at least 12 credits of coursework and Upper Second Class standing in the remaining coursework. Applicants whose academic standing does not meet these requirements, but who have had sufficient formal training and relevant professional experience in law to offset such deficiencies, may be considered for admission.

A candidate's admission is not complete until the application has been accepted and the course of study has been approved by the Faculty of Law.

Requirements of the Program

The LL.M. program in law is administered by the Faculty of Law. The requirements for the LL.M. are:

- 1) Full-time residence at the University for a minimum of one academic year (September to May).
- 2) Twelve credits of coursework, chosen in consultation with the Faculty of Law, and the required Graduate Seminar for 4 credits. A candidate must obtain an overall average of 70% on the work of the year with no more than one mark falling below 70% and no mark below 65%.
- 3) A thesis of satisfactory quality prepared under the direction of a member of the Faculty of Law on a subject related to the general program of study of the candidate (20 credits). Its preparation should occupy half of the candidate's time in the program. 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.
- 4) An oral examination covering the course work, the written work, or both. This requirement may be waived by the Faculty of Law.

The program for each candidate will be designed to meet the candidate's 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 resources. Students may write their theses, under the supervision of members of the Faculty, in the specific fields of law in the undergraduate curriculum or in 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 2) above, but it is expected that the major part of the program will be undertaken in the Faculty of Law.

Interdisciplinary Degrees

The University offers interdisciplinary Master's (M.A.) and Doctoral (Ph.D.) programs in the Faculty of Graduate Studies. These programs are particularly appropriate for students of law with research and teaching interests in legal history, jurisprudence, social sciences, and other interdisciplinary areas. Further information on these degree programs is available from the Faculty of Graduate Studies.

Application

Candidates seeking admission to the graduate program should obtain application forms and other information from the Faculty of Law or the Faculty of Graduate Studies. Completed forms must be received by the Faculty of Law by April 30 preceding the academic year for which admission is sought from Canadian and U.S. applicants and by March 31 from international applicants. All applicants who wish to be considered for fellowships must, however, apply before January 15.

LL.B./M.B.A. Combined Program

The Faculty of Law and the Faculty of Commerce and Business Administration will not offer the combined program leading to the degrees of Bachelor of Laws (LL.B.) and Master of Business Administration (M.B.A.) in the 1995/96 academic year and no students will be admitted to the combined program that year.

The following requirements of the combined program apply to students already in the combined program. The application of these requirements may be modified in the 1995/96 academic year.

Requirements of the Combined Program

Except as stated below the ordinary requirements of the degrees of LL.B. and M.B.A. apply to students in the Combined Program.

Students in the Combined Program are required to take 86 (83 with permission) credits of courses in Law and 57 credits in the M.B.A. program in four Winter Sessions and one Summer Session, as follows:

	Credits
Year 1: First Year Law	32
Year 2: First Year M.B.A.	33
Year 3: 27 credits in Law and six credits of 500-level Commerce or, with the permission of the Joint Degrees Committee,* 24 credits in Law and nine credits of 500-level Commerce	33
Year 4: 27 credits in Law, Commerce 591 (three credits), plus three credits of 500-level Commerce course work or, with the permission of the Joint Degrees Committee,* 24 credits in Law, Commerce 591 (three credits), three credits plus six credits of 500-level Commerce course work	33
Summer Session (years 2 and 3, and between years 3 and 4 or after year 4): nine credits of 500-level Commerce	9
Total	140

* Such permission will be granted for either year 3 or year 4, (but not both) to ensure that a minimum of 57 credits are taken in the M.B.A. program.

Requirements During Years 3 and 4, and Summer Session

- **Commerce Requirements** — Students will be required to take 24 credits of 500-level courses in Commerce including Commerce 591 (three credits) to be selected in accordance with the normal rules applying to the M.B.A. program, but subject in all cases to the final approval of the Joint Degrees Committee. Six credits of senior Law courses will count as credit toward the M.B.A. degree. In addition students are required to complete a (non-credit) major essay and to write a comprehensive examination as part of the M.B.A. program.
- **Law Requirements** — A total of 54 credits of Law courses must be taken in Years 3 and 4 as follows:

	Credits
a) Required Courses	
All Students must take:	
Law 300, Moot Court	2
Law 379, Evidence	1
Law 325, Business Associations I	4
Students who have not previously obtained credit for Commerce 355, Income Taxation, are required to take Law 330, Taxation I. Students who have previously obtained credit for Commerce 355, may not take Law 330, but are required to take in substitution a Law course of equivalent credit value. Commerce 355 will be deemed equivalent to Law 330 for prerequisite purposes	3
b) Restricted Electives	
A minimum of 20 credits of senior courses in Law must be chosen from a set of Law courses in the corporate, commercial, or taxation area as determined from year to year by the Joint Degrees Committee. The choice of electives is subject to the approval of the Joint Degrees Committee.	20 or more
c) Free Electives	
Subject to the prior approval of the Joint Degrees Committee, a student may take any senior Law Courses of a combined credit value not exceeding 21.	21 or less
Total	54

Restrictions

Students in the Combined Program are not eligible for the Law Faculty non-Law option.

Special Arrangements

Subject to the approval of the Joint Degrees Committee,

- The first years of the LL.B. and M.B.A. programs may be interchanged upon petition.
- Students who have successfully completed the first year of the M.B.A. may, as an alternative to taking six credits of Commerce 500-level courses during the

Winter Sessions of Years 3 and 4, take such courses in Summer Session before Year 4;

- Students who receive exemption for courses in the first year of the M.B.A. program will have their credit requirement reduced accordingly. Such exempted courses may be replaced by 300-400 level courses for which no graduate credit will be granted or by 500-level Commerce courses for which graduate credit will be granted. In the latter case the required credits of 500-level Commerce courses subsequent to Year 2 will be reduced accordingly.

Promotion Requirements

Continuance in the M.B.A./LL.B. degree program is conditional upon a high standard of performance as determined by an annual review by the Joint Degrees Committee. A student may be permitted to complete either an M.B.A. or an LL.B. alone.

Granting of Degrees

The LL.B. and M.B.A. degrees will be conferred at the completion of the Combined Program after all requirements for both degrees have been met. Students who choose to receive either the M.B.A. or LL.B. degree prior to completion of the Combined Program may apply for one of the degrees provided all requirements for that degree have been satisfied. Students selecting this option must simultaneously withdraw from the Combined Program.

Library, Archival and Information Studies, School of

Professor and Director: K. Haycock.

Professor and Chair of the Program: P. Simmons.

Professor: R. Hagler.

Associate Professor: J. M. Saltman.

Assistant Professors: A. Curry, R. L. Hopkins, L. Lighthall.

Instructors: S. Crooks, M. S. Stephenson.

Lecturer: W. Sutton (Language Education).

M.L.I.S. Degree

The Master of Library and Information Studies program is a professional degree program open to those holding a Bachelor's degree considered suitable by the Admissions Committee, and which meets the minimum requirements of the Faculty of Graduate Studies. Those applying to enter the program are expected to have a strong foundation in some specialist studies but also an enthusiasm for information and its uses in the wider sense. The program, accredited by the American Library Association, is one of some fifty in North America, including seven in Canada, which gives its graduates professional stature in the library world. Most graduates employed in academic, public, school, or special libraries combine work with information and its users with some aspects of supervision and the management and planning of library services. Graduates not working in libraries as such are to be found in a wide variety of positions involving the uses of information in their broadest context; many are self-employed.

The degree is awarded on successful completion of 48 credits of course work and non-credit requirements. Although designed to occupy two successive Winter Sessions, much of the program, which can include Summer-Session courses, may be taken on a part-time basis. Students must begin the program in September of a year. A required non-credit two-week practicum normally follows Term 2 of the first year. Term 1 of the first year consists of four required courses. The remainder of the program includes four additional required courses, elective courses chosen from a wide variety of specialist

offerings, and either a thesis or a major essay. The required practicum and field trips in courses, the option of formal professional experience, and the use of some practitioners as sessional lecturers assure a practical orientation to the theory of information management. Libraries of different types in the greater Vancouver area provide models of successful practice.

Linguistics

Professor and Head: M. D. Kinkade.

Professor: D. Ingram.

Associate Professors: G. Carden, D. Pulleyblank, P. Shaw, M. Rochemont.

Assistant Professors: H. Davis, R.-M. Déchaine.

Lecturers from other Departments: C. Phan (French),

K. I. Kobbervig (Hispanic and Italian Studies).

Ph.D. and M.A. Degrees

The Department offers opportunities for advanced study in Linguistics leading to the degrees of M.A. and Ph.D.

The M.A. in Linguistics may be taken with or without a thesis in accordance with the general regulations.

The areas of research in which students may be accepted for the Ph.D. include linguistic theory, language acquisition, American Indian linguistics, historical and comparative linguistics, psycholinguistics and language typology and universals.

Course work for all graduate students is planned on the basis of individual requirements and research projects. Appropriate interdisciplinary programs may be arranged.

More detailed information may be obtained from the Department.

MAGIC (Media and Graphics Interdisciplinary Centre)

Director: K. S. Booth.

The Media and Graphics Interdisciplinary Centre (MAGIC) was created at UBC to foster research covering the entire spectrum of new computer-based and computer-associated media. Typical examples include multimedia, computer animation, 3-D modelling, interactive video disc applications, hypermedia, computer music and computer speech recognition and synthesis. The Centre highlights UBC's commitment to the use of advanced media technology, and brings together existing efforts and new initiatives from various research programs. MAGIC serves as a catalyst to assimilate and exploit new technology in research and education at UBC and to strengthen interaction with industry through collaborative research projects. Projects affiliated with MAGIC have their own funding, although MAGIC provides shared facilities and personnel to assist in the start-up phases of projects and in the design and evaluation of research prototypes. MAGIC does not grant degrees directly. Students earn degrees within existing programs, conducting research within MAGIC projects.

Mathematics

Professor and Head: D. P. Rolfsen.

Professors: R. A. Adams, G. Bluman, D. W. Boyd, A. T. Bui,

D. Bures, J. B. Carrell, W. A. Casselman, R. V. Chacon,

C. W. Clark, R. Douglas, J. S. Feldman, J. J. F. Fournier,

A. Fret, N. Ghousoub, E. E. Granirer, P. Greenwood, U. G. Haussmann, J. C. Heywood, K. Hochsmann, K. Y. Lam, D. Ludwig, E. Luft, J. L. MacDonald, R. M. Miura, S. S. Page, E. Perkins, R. A. Restrepo, L. Rosen, B. R. Seymour, D. K. Sjerve, C. A. Swanson, J. Walsh, R. Westwick.

Associate Professors: A. Adler, R. F. V. Anderson, R. Anstee, M. Barlow, A. H. Cayford, B. Chang, J. E. Coury, R. Froese, R. Gupta, R. Israel, L. Keshet, P. J. Kiernan, P. Loewen, G. Maxwell, D. H. Peterson, L. G. Roberts.
Assistant Professors: D. Austin, J. Friedman, C. W. Lamb, K. W. Nagata, M. Ward, B. T. R. Wetton.

Ph.D., M.Sc. and M.A. Degrees

The Department of Mathematics offers programs of study in most branches of pure and applied mathematics. Students should consult the brochures, available from the Department, containing descriptions of courses and of programs as well as information on financial aid and application forms. Students particularly interested in applied mathematics and/or statistics should also consult the listing under the Institute of Applied Mathematics and the Department of Statistics in the *Calendar*.

Mathematics and Science Education

Professor and Head: D. F. Robitaille.

Ph.D., Ed.D., M.A., and M.Ed. Degrees

The Department is one of seven departments in the Faculty of Education. It offers M.Ed. and M.A. programs in the areas of Business Education, Home Economics Education, Technology Studies Education, Mathematics Education and Science Education. It offers an Ed.D. in Mathematics Education and Science Education, and a Ph.D. in Curriculum and Instruction with a focus on the department's areas of specialization. Interested students should refer to the section of the *Calendar* on the Centre for the Study of Curriculum and Instruction for details on the Ph.D. Masters programs can be completed though part-time or full-time study. Both the M.Ed. and M.A. programs consist of at least 30 credits of coursework at the 300 level or above with at least 24 credits of coursework selected from courses numbered 500 or above. In addition, the M.Ed. program includes comprehensive examinations and a major paper. The M.A. program includes completion of a thesis (six credits).

Faculty in the Department have particular research interests in teacher education, constructivist views of student learning, gender equity, student assessment, health, technology and science issues in learning. Specific expertise relates also to the application of computers in teaching all school subjects, and specifically science and mathematics. The Department has a Multimedia Ethnographic Research Laboratory used to explore the applications of multimedia in ethnographic inquiry.

Applicants to masters programs are normally required to have two years of teaching experience. All applicants must submit with their applications a statement of intent clearly outlining their areas of interest and focus for study. Doctoral applicants are required to submit a sample of their writing.

For further information, please contact the Department of Mathematics and Science Education, Faculty of Education, 2125 Main Mall, Vancouver, B.C. V6T 1Z4; telephone (604) 822-5422, fax (604) 822-4714.

Mechanical Engineering

Professor and Acting Head: R. L. Evans.
Professors: K. V. Brury, S. M. Calisal, D. B. Cherchas, C. W. de Silva, I. S. Gartshore, P. G. Hill, S. G. Hutton, M. Iqbal, V. J. Modi, H. Ramsey, M. E. Salcedean, H. Vaughan, J. Yellowley.
Associate Professors: Y. Altintas, A. B. Dunwoody, M. Gadala, D. P. Ronilly, F. Sassani, G. S. Schajer.
Assistant Professors: E. A. Croft, D. W. H. Fraser, S. I. Green, M. Hodgson, S. N. Rogak.
Senior Instructor: D. W. McAdam.

M.Eng., M.A.Sc. and Ph.D. Degrees

The M.Eng. is a study program suited to students who wish to pursue their Mechanical Engineering education beyond the undergraduate level, but who do not wish to pursue a thesis research program. Requirements for the M.Eng. degree include satisfactory completion of 30 credits of courses, 24 of which must be for courses numbered 500 and above, a report, and a comprehensive examination. A typical completion time for the M.Eng. degree is 12 months. Financial aid is generally not available to M.Eng. students. The M.Eng. degree is not recommended as preparation for Ph.D. studies. Applicants who are considering taking a Ph.D. degree in the future should apply for admission to either the M.A.Sc. or Ph.D. program.

The M.A.Sc. is a graduate-level study program that includes a research investigation and the writing of a thesis. Requirements for the M.A.Sc. degree include satisfactory completion of 30 credits of graduate-level courses, original research under the supervision of a faculty member, and a thesis. The thesis is assigned 6 to 12 credits and is counted as part of the course work requirement. A typical completion time for the M.A.Sc. degree is 24 months. Subject to satisfactory progress and acceptance by a faculty supervisor, a successful M.A.Sc. graduate may transfer to a course of studies leading to the Ph.D. degree.

The Ph.D. is an advanced graduate-level study program which includes a major research investigation and the writing of a thesis. Requirements for the Ph.D. degree include satisfactory completion of 36 credits of courses beyond the Bachelor's degree level, original research under the supervision of a faculty member, and a thesis. A typical completion time for a Ph.D. is four to five years' work beyond the Bachelor's degree level. It is normal departmental practice to register students initially for the M.A.Sc. degree. Transfer to the Ph.D. program can take place either on completion of the M.A.Sc. or, if the student's performance is of sufficiently high quality, may be recommended by supervising faculty before completion of the M.A.Sc. An applicant holding a Master's degree from another institution will have the course requirements for the Ph.D. degree assessed on an individual basis.

Fields of research are: acoustics; aerodynamics and fluid mechanics; automatic controls; robotics and industrial automation; energy conversion, combustion, thermodynamics and heat transfer; vibrations and space dynamics; solid mechanics; bioengineering and biomechanics; design and manufacturing processes; industrial engineering and applied statistics; and naval architecture. A brochure describing current projects is available on request. Applicants for graduate degrees may be considered for appointment as research assistants, teaching assistants or markers in the department. Students' courses are selected in consultation with faculty to suit their research or career needs. Not all courses listed in the *Calendar* are offered every year.

Medical Genetics

Professor and Head: J. M. Friedman
Professors: P. A. Baird, C. J. Eaves, J. G. Hall, M. R. Hayden, D. M. Juriloff, W. R. McMaster, A. M. Rose, S. Wood.
Associate Professors: F. J. Dill, M. J. Harris, W. A. Jefferies, S. Langlois, D. L. Mager, B. C. McGilivray, A. D. Sadovnick, R. D. Wilson.
Assistant Professors: C. Brown, R. J. Kay, W. Robinson.
Associate Members: D. A. Applegarth, T. A. Grigliatti, R. K. Humphries, D. K. Kalousek, M. G. Norman, G. B. Spiegelman, F. Takei, G. Weeks.

Ph.D. and M.Sc. Degrees

The Department of Medical Genetics offers advanced study and research leading to the M.Sc. and Ph.D. degrees in a variety of areas of human and medical genetics. The Department has particular strength in human molecular genetics, genome analysis, developmental genetics, gene therapy, cytogenetics, oncogenetics, immunogenetics, genetic epidemiology, genetics of common disorders, and clinical genetics. Required courses include MEDG 520, 530 and 540. In addition, M.Sc. students must successfully complete MEDG 519 and at least 6 additional credits in approved elective courses; Ph.D. students must successfully complete a comprehensive examination and thesis (MEDG 649).

Students admitted to the program will normally have an undergraduate degree in science, including introductory courses in genetics, biochemistry, and statistics.

M.Sc. Genetic Counselling

The Department offers a two-year program of advanced study leading to the M.Sc. degree in Genetic Counselling. This is a master's degree program without thesis. The program provides a strong academic component focusing on the fundamental and applied principles of human genetics and in-depth clinical experience necessary for the genetic counsellor. Required courses include MEDG 530, 550, 560, 565, 570, 575, 548 and CNPS 362. Students must also successfully complete a written final comprehensive examination.

Admission

To gain acceptance to the program, a student must show evidence of first class standing in at least 12 credits and at least upper second class standing in the remaining course work at the Third and Fourth year level. Students admitted to the program will normally have an undergraduate degree in Science, including introductory courses in Genetics (BIOL 334 or equivalent), Biochemistry, and Statistics or approval of the Director. An interview with the program's admission committee is required prior to acceptance.

Medicine

Combined M.D. and Ph.D. Degree

This is an integrated program jointly offered by the Faculty of Medicine and the Faculty of Graduate Studies. Its purpose is to provide selected and highly qualified students the opportunity to combine their medical school experience with intensive scientific training in pursuing a career as clinician-scientists in a chosen field. The program is designed such that students can receive the dual M.D./Ph.D. degrees after successful completion of six to seven years of enrolment. The program of study is built upon the regular M.D. curriculum, but is further "customised" to meet the unique career goals of individual stu-

dents based on their background, previous research experience, and their chosen medical field of expertise. Thus, graduates of the M.D./Ph.D. Program are trained as competent physicians as well as skilled scientists who can sustain a successful and competitive clinical investigative career.

Admission

To be eligible for admission, the student must have completed a B.Sc. degree with **First Class standing** (or equivalent), and have fulfilled all the requirements of acceptance into the four-year medical curriculum of the Faculty of Medicine, and the doctoral requirements of the Faculty of Graduate Studies. All candidates are required to take the Medical College Admission Test (MCAT), but the Graduate Record Examination (GRE) is optional.

Requirements

Students must demonstrate proficiency in all required coursework by examination. They must also successfully complete a comprehensive examination based on their proposed research, and defend their thesis by oral examination. Additionally, each student will be evaluated at least annually by the research supervisory committee; continuation in the dual degree program is contingent upon satisfactory scholastic and research progress.

Application

Applications to the M.D./Ph.D. program should be submitted to the M.D./Ph.D. Program in the Dean's Office, Faculty of Medicine, at the same time that applications are made to the regular four-year medicine program. Potential candidates will be interviewed separately and independently by an M.D./Ph.D. Committee following initial screening by the Faculty of Medicine Admissions Committee.

Financial Assistance

Students in the M.D./Ph.D. program are expected to apply to granting agencies and the UBC Graduate Fellowship awards at the time of applications for admission. In addition, a limited number of awards are available each year on a competitive basis which provide a stipend equivalent to the current MRC studentship awards.

Metals and Materials Engineering

Professor and Head: T. R. Meadowcroft.
Professors: J. K. Brimacombe, E. B. Hawbolt, A. Mitchell, D. Tromans, I. V. Samarasekera.
Associate Professor: D. B. Dreisinger, N. R. Risebrough.
Assistant Professors: P. V. Barr, S. L. Cockcroft, D. G. Dixon, A. Poursartip, T. Troczynski, R. Vaziri.

Research Opportunities

The Department offers opportunities for study in the following fields: casting and solidification of metals, ceramic processes and properties, corrosion, fibre composites, hydrometallurgy and electrorefining, physical metallurgy, pyrometallurgy, remelting processes, thermo-mechanical processing and environmental processing.

A brochure describing the research facilities is available on request from the Department.

M.A.Sc. Degree (Metals and Materials Engineering)

Prerequisite: Graduation in Metals and Materials Engineering, Metallurgical Engineering, Mechanical Engineering, Chemical Engineering or Engineering Physics with at least upper Second Class standing (72%).

M.Sc. Degree (Materials and Metallurgy)

Prerequisite: Graduation in Physics, Chemistry, Mathematics and Physics with at least upper Second Class standing.

M.Eng. Degree (Metals and Materials Engineering)

This degree is intended primarily for graduates in Applied Science who may wish to extend their knowledge after a period of engineering practice following graduation.

Ph.D. Degree (Metals and Materials Engineering)

Prerequisite: Master of Applied Science degree in a suitable discipline.

Ph.D. Degree (Materials and Metallurgy)

Prerequisite: Master of Science degree in a suitable discipline.

After one year's residence at UBC and clear evidence of research ability, outstanding M.A.Sc. and M.Sc. candidates may, subject to the regulations of the Faculty of Graduate Studies, be transferred to a Ph.D. program.

Microbiology and Immunology

Professor and Head: J. Davies.
Professors: B. C. McBride, R. E. W. Hancock, D. G. Kilburn, J. Levy, R. C. Miller, Jr., G. B. Spiegelman, H. S. Teh, R. A. J. Warren, G. Weeks.
Associate Professors: J. T. Beatty, G. W. Hoffmann, J. K. Smit.
Assistant Professors: B. Finlay, M. Gold, W. A. Jefferies, P. Johnson, J. W. Kronstad, N. W. Lem, W. Mohn, F. Tufaro.
Associate Members: C. Chanway, A. Chow, A. C. Eaves, N. L. Glass, N. Kelly, W. R. McMaster, J. Piret, N. Reiner, D. Rochon, J. Saddler, J. Schrader, D. Speert, F. Takei, D. Waterfield.

Ph.D. Degree

The Department offers opportunities for original research in the areas of molecular and applied microbiology, biotechnology and cell biology including: immunology, molecular biology, molecular genetics, pathogenicity, cellular and tumor immunology, oral microbiology, virology and medical microbiology. The Department has excellent research funding and a commitment towards high quality, modern research. Students may be required to take a Molecular Microbiology Techniques course (MICB 506) as well as a Seminar Course (MICB 530) during their first term in the Department. In addition, they will be required to pass a Comprehensive Examination on topics related to their research area of interest within 18 months of arriving in the Department. Full details of research interests in the department are set out in the Departmental Graduate Handbook obtainable from the Departmental Graduate Applications Committee.

M.Sc. Degree

Students will enroll in a Molecular Microbiology Techniques course (MICB 506) and a Seminar Course (MICB 530) in addition to at least nine credits in other courses. In addition, the student must perform research work under one of the above supervisors and write and defend a thesis based on this research.

Microelectronics, Centre for Advanced Technology in

Director: N. A. F. Jaeger (Electrical Engineering).

This Centre was created to foster graduate student training and research in the design, fabrication, and theory of operation of electronic, opto-electronic, and integrated optic devices, in particular, silicon, compound semiconductor, and lithium niobate based integrated circuits. A solid state microelectronics laboratory in the Department of Electrical Engineering is the core of the present program of the Centre.

The Centre has a Board of Management comprising the Dean of Graduate Studies, the Deans of Science and of Applied Science and the Head of Electrical Engineering. Applicants for graduate work in the field of applied microelectronics should contact the Director of the Centre.

Mining and Mineral Process Engineering

Professor and Head: T. R. Meadowcroft.
Professors: C. O. Brawner, J. S. Laskowski, A. L. Mular, G. W. Poling.
Associate Professors: A. E. Hall, R. W. Lawrence, J. A. Meech.
Assistant Professors: R. Pakalnis, R. Poulin.

Research Opportunities

The department offers opportunity for study in the fields of mining and mineral processing, including coal preparation. Areas of research interest are:

- Mining — Mine property evaluation and mining economics, acid rock drainage, mine design, mining methods, drilling and blasting, rock mechanics and slope stability, computer simulation of mining operations, and mine services particularly mine ventilation and climatic control.
- Mineral Processing — Unit operations, comminution, process modelling and optimization, expert systems, instrumentation and computer control. Flotation, surface chemistry, fines recovery, effluent control and pollution prevention, coal recovery, treatment of fine and oxidized coal, and precious metals recovery.

The following degrees are offered:

M.A.Sc. Degree

This program combines research and course work and requires a total of 30 credits.* A research thesis is assigned between six to 12 credits by the Head of the Department in consultation with the Research Supervisor.

M.Eng. Degree (Part-time or full-time)

This program is a course work Master's program intended for engineers who wish to upgrade their skills or develop new expertise in a particular specialized subject area. A total of 30 credits of course work are required, 24 of which must be 500-level graduate courses. An engineering report must be submitted as part of an oral examination to complete the degree.

Mining:

Mining Methods and Design
Rock Mechanics
Mineral Economics

Mineral Processing:

Coal Preparation
Simulation and Control
Environmental Protection
Occupational Health

Each of these programs of study consists of 18 credits of core subjects at the graduate level. Six credit minimum of optional graduate level courses and six credits maximum of undergraduate level (300 or 400) series) courses. De-

tails of course selection strategies can be obtained from the head of Department or the Graduate School Coordinator. Course substitution to these approved programs can be arranged with the approval of the head of Department.*

Ph.D. Degree

Combines course work with a research thesis.

Students select their courses in consultation with faculty to suit their research needs.*

Admission

Students must satisfy the admission requirements of the Faculty of Graduate Studies including, for international students whose first language is not English, a minimum TOEFL score of 570.

Part-time students are actively encouraged by the department and interested applicants should contact the department for further information regarding course schedules.

Students who wish to be considered for financial assistance should apply for admission as early as possible.

* Not all courses listed in the *Calendar* are offered every year.

Music

Professor and Director: R. Silverman.

Professors: W. E. Benjamin, M. C. Berinbaum, G. G. Butler, S. G. Chatman, J. A. Coop, A. Dawes, J. L. Fankhauser, J. Read, R. Rogers, G. Stanick, F. A. Tickner.

Associate Professors: K. A. Hamel, N. Hermiston, J. E. Kreider, J. B. Roeder, J. E. Sawyer, J. R. Schell, R. Sharon, A. R. Thrasher, E. J. Wilson, E. N. Wilson.

Assistant Professors: R. Kurth, V. Micznik.

Ph.D., D.M.A., M.A., and M.Mus. Degrees

The School of Music offers graduate programs and degrees in three broad fields of specialization: performance, composition, and music scholarship. The M.Mus. and D.M.A. are offered in performance and composition; the M.A. in theory, historical musicology, and ethnomusicology; and the Ph.D. in theory and historical musicology. Master's degrees are available on a part-time basis.

Performers in the M.Mus. may concentrate in piano, organ, guitar, orchestral instruments, voice, and opera; the areas of concentration within the D.M.A. are piano, voice, and orchestral instruments. In addition to fulfilling recital requirements for their degrees, students of performance have many opportunities to play in large and small ensembles of substantial quality, both for credit and in voluntary support of colleagues. Ensembles specializing in new music, early music, and non-European music are available for credit. The School typically presents one fully staged opera, with large or small orchestral accompaniment, each year.

Graduate student composers have occasions to hear their works in regularly scheduled concerts as well as in their degree recitals. The UBC Symphony performs or reads students' orchestra pieces from time to time and the choirs are all active in presenting student works. The computer music studio is of considerable scope and is open to students on a 24-hour basis.

Areas of research emphasis pursued by faculty include 1) Renaissance sacred polyphony; 2) source studies in the music of Bach and other major composers; 3) Italian Baroque opera, especially Handel; 4) nineteenth-century topics (program music, form, harmony); 5) Second Viennese School; 6) issues in rhythmic analysis; 7) theory construction and analytical method; 8) computer-based

analysis 9) aspects of modern and contemporary music and musical life; and 10) music of East Asia (especially China). The faculty in performance and composition includes many figures well-known throughout Canada and beyond for their work in concert, on radio, and on CD's.

The School occupies a well-equipped building of moderate size, which includes a fine recital hall (300 seats). A large concert hall (1400 seats) is now under construction. The Music Library is in the Music Building and houses the second largest collection in Canada, including over 70,000 books and scores. Among its holdings are particularly good microfilm collections of European manuscript sources, of 19th-century music journals, and of materials relating to the music of Brahms. The School owns a growing collection of instruments, including 125 pianos, several important violins, a 64-rank organ by Casavant (1969), many historical wind and string instruments, and numerous instruments representing several Asian traditions.

The School admits (to Master's degrees) highly qualified students who possess a B.Mus. degree or a B.A. with a strong music major. In addition to standard materials required by the University, applicants in performance must submit (to the School's graduate secretary) a tape of ample scope and good audio quality, or else appear for an in-person audition. Composers must submit the scores and tapes of about four representative works. Both composers and performers should submit an example of formal writing, either a term paper or statement of goals. Applicants in the scholarly areas should submit at least two term papers. The School asks all applicants to take the GRE subject and general tests wherever possible. Where an exception is made, and an applicant with a persuasive record is admitted with a GRE subject test score below 55%, or without furnishing GRE scores, the applicant will be asked to take placement tests in music theory and history in early September, and could be required, depending on the results of these tests, to do remedial course work. All entering graduate students are expected to have levels of keyboard proficiency appropriate to successful completion of two years of class piano and will be asked to demonstrate this before beginning their studies.

Credit requirements are as follows:

- For the M.A., 30 to 32 credits, typically including a six-credit thesis, and 14 to 18 credits of required courses. Proficiency in one appropriate language must be demonstrated.
- For the M.Mus., 33 to 39 credits, including a six-credit thesis comprised of one or more required recitals, and 18 to 25 credits of required courses (including private study).
- For the D.M.A. in composition, 33 credits of course work, 15 of which are in the major field, a completed portfolio of works, demonstrated proficiency in one foreign language, comprehensive examinations, and a thesis comprising a major work and accompanying document; for the D.M.A. in performance, 42 to 44 credits, of which 60% are in the major field, comprehensive examinations, and a thesis comprised of four recitals and a written document.
- For the Ph.D., 27 credits of course work, comprehensive examinations, and a thesis. Students in historical musicology must demonstrate proficiency in at least a second foreign language.

Students wishing to apply or needing more detailed information should contact the Graduate Secretary, School of Music, The University of British Columbia, 6361 Memo-

rial Road, Vancouver, B.C., Canada V6T 1Z2; telephone: (604) 822-2079, fax: (604) 822-4884.

Neuroscience

Chair: S. R. Vincent (Division of Neurological Sciences, Department of Psychiatry).

Ph.D. and M.Sc. Degrees

The Neuroscience Program is administered by the Neuroscience Advisory Committee which is responsible to the Dean of the Faculty of Graduate Studies. The Neuroscience Program is flexible and is intended to accommodate the diverse background of students wishing to enter it, and also takes into account the broad nature of neuroscience research. The program will accept for advanced degrees candidates with undergraduate majors in a variety of disciplines including but not restricted to Biology, Biochemistry, Computer Sciences, Engineering, Mathematics, Neurosciences, Pharmacology, Physics, Physiology, Psychology and Zoology. Graduates with a professional degree (M.D., D.M.D., D.V.M.) may also be accepted into the program. Acceptance into the program is dependent upon a) meeting the general entrance requirements of the Faculty of Graduate Studies, b) acceptance by the Neuroscience Admissions Committee, and c) acceptance from a faculty member willing to act as the student's supervisor in a graduate program in Neuroscience.

The student's graduate program will be decided upon by the student and the student's supervisory committee. The formal requirements in this regard, other than those set forth by the Faculty are as follows. The program aims for flexibility so that the individual needs of students with different interests in neuroscience can, as far as possible, be accommodated. Course requirements are normally taken in the first year of the program, and include the comprehensive core courses in Neuroscience (NRSC 500 and 501), as well as courses in Neuroanatomy and Neurophysiology (PHYL 425 and ANAT 510). Courses taken at other universities or in the undergraduate program at UBC will be taken into consideration in planning the student's core course curriculum. Additional advanced course and seminar requirements will vary with the particular interests and needs of the student as determined by the student and his Supervisory Committee. Admission requirements for the Graduate Program in Neuroscience include submission of Graduate Record Examinations (GRE) and, where required for international students, Test of English as a Foreign Language (TOEFL) scores.

Additional information on the graduate program in Neuroscience can be obtained directly from the Chair of the Neuroscience Graduate Program, 2255 Wesbrook Mall, Vancouver, B.C., V6T 1Z3, Canada; telephone (604) 822-7375, fax (604) 822-7981, or from the Dean of Graduate Studies.

Nursing

Professor and Director: K. A. May.

Professors: J. Anderson, E. Davies.

Associate Professors: S. Acorn, A. Hilton, C. Jillings, S. Thorne, A. Wyness.

Assistant Professors: C. Canam, M. Dewis, V. Hayes, A. M. Hughes, R. Thompson.

Ph.D. and M.S.N. Degrees

The M.S.N. program is designed to prepare administrators, teachers, and clinical nurse specialists and to serve as preparation for students planning to undertake a program leading to the Ph.D. degree. The M.S.N. degree is awarded for 34 credits of course work and a thesis for six credits or 40 credits of course work, at least one major essay, and a comprehensive examination. Applicants must meet the admission requirements of the Faculty of Graduate Studies and have graduated from a baccalaureate program in nursing that included community health nursing, psychiatric nursing, and statistics. They must also hold current practicing B.C. nursing registration or be eligible to so register. The program may be pursued on a part-time basis.

	Credits
Required Courses	19
Specialization Courses	14
Major Essay Option - Courses	6
Thesis	6

The Ph.D. program is designed to prepare researchers. The program combines core courses totalling 12 credits, support courses as specified by the supervisory committee, and a thesis. A comprehensive examination is held upon completion of all required course work, normally after the first year of study. Research preparation occurs within the context of ongoing faculty research. Prior to admission to the program, applicants identify their area of research and are admitted to the program on the basis of the availability of a faculty member working in that area. The student develops a research project within, or complementary to, the faculty member's research program. Fields of research are family health care, especially the health care of women and children; individual and family coping with life-threatening and chronic illness and disability; cross-cultural health care; and aging. Applicants must meet the admission requirements of the Faculty of Graduate Studies and hold a Master's degree in nursing which includes preparation in nursing theory development and research methods. They must also hold current practicing B.C. nursing registration or be eligible to so register. Superior M.S.N. students may apply to transfer to the Ph.D. program after the first year of course work has been completed.

For further information contact the Graduate Adviser, School of Nursing, The University of British Columbia, T206 - 2211 Wesbrook Mall, Vancouver, B.C., V6T 2B5; telephone (604) 822-7446, fax (604) 822-7466.

Obstetrics and Gynaecology

Reproductive and Developmental Sciences

Professor: J. L. Benedet.

Program Director: P. C. K. Leung.

Professors: N. A. Auersperg, J. T. Emerman (Anatomy).

B. Ho Yuen, C.-Y. G. Lee, P. C. K. Leung, P. F. McComb,

Y. S. Moon, A. M. Perks (Zoology), D. Rurak, J. P. Skala (Paediatrics).

Professor Emeritus: P. Hahn.

Associate Professor: R. Rajamahendran (Animal Science).

Associate Members: S. B. Effer, T. Ehlen, D. F. Farquharson,

M. R. Fluker, S. Gillam (Pathology), S. Innis (Paediatrics),

D. Kalousek (Pathology), J. Kristinger, W. Riggs (Pharmaceutical Sciences), T. C. Rowe, P. Taylor, W. J. Tze

(Paediatrics), M. P. R. Walker, K. P. Williams.

Ph.D. and M.Sc. Degrees

The Department of Obstetrics and Gynaecology offers M.Sc. and Ph.D. programs in Reproductive and Developmental Sciences. Areas of study are: 1) Reproductive

Science; 2) Perinatal and/or Developmental Biology; 3) Gynaecologic Oncology. The areas of research include: reproductive and placental endocrinology, cellular and molecular biology, immunology of reproduction, fertilization and embryonic development, perinatal metabolism, fetal and neonatal physiology. Prerequisites: BIOC 300; PHYL 301 or BIOL 353/363 or ANSC 320.

Occupational Hygiene

Director and Associate Professor: S. M. Kennedy

Assistant Professors: P. Demers, M. Hodgson.

Associate Members: G. S. Bates (Chemistry), D. Bell (UBC

Health, Safety and Environment), J. L. Bert (Chemical

Engineering), M. Brauer (Medicine), A. Brose (WCB),

C. Chessor (WCB), C. Hertzman (Health Care and

Epidemiology), K. Teschke (Health Care and Epidemiol-

ogy), C. Van Netten (Health Care and Epidemiology),

J. Village (WCB).

M.Sc. Degree

An interdisciplinary program is offered leading to the degree of M.Sc. in Occupational Hygiene. Occupational Hygiene is the study of occupational and environmental risks to health and specifically includes recognition, evaluation, and control or management of such exposure risks. The program is designed to prepare students for careers in industry, government, or para-government sectors. The student may follow either of two options: 1) 39 credits of courses and a six-credit project, requiring a minimum of 16 months of full-time study or equivalent amount of time on a part-time basis; 2) 33 credits of courses and a 12-credit thesis, generally requiring 20-24 months of full-time equivalent work. The required courses include: OCCH 501, 502, 503, 504, 506, 507, plus CJIML 506; HCEP 510; MECH 505; and either of OCCH 598 or 599.

Ph.D. work in the field of Occupational Hygiene may be conducted through the the individual Interdisciplinary Studies route described in a separate *Calendar* entry in this section.

Admission

Prospective applicants should have completed a Bachelor's degree in such areas as the physical or health sciences or engineering. Before commencing the program, students should have successfully completed university-level courses or have equivalent background in calculus, physics, organic chemistry, biology, and statistics. Applicants should consult a faculty adviser regarding their academic background. In exceptional circumstances a student may be allowed to take some courses required for admission as corequisites in conjunction with the program, extending the program over a full two-year period.

Application

Candidates should obtain application materials and more detailed information from the Occupational Hygiene Program Office. Completed application forms must be received in the program office by March 31 for admission in September. Students wishing to be considered for scholarship or fellowship support are encouraged to apply as early as possible in the fall of the year preceding the year to which admission is sought.

Ocean Studies Council

Chair: M. C. Healey (Westwater Research Centre).

The Ocean Studies Council consists of faculty members from a number of disciplines with research interests in various aspects of the oceans. Representatives from the Faculties of Commerce, Forestry, Graduate Studies, and Law; from the Departments of Anthropology and Sociology, Bio-Resource Engineering, Economics, Geography, Mathematics, Oceanography, Physical Education, Political Science, Slavonic Studies, and Zoology; and from the following institutes: Asian Research, International Relations and Westwater Research; and other groups with related interests such as Resource Ecology constitute the Council.

The Council has as its primary function the promotion of interdisciplinary research on ocean matters within the University. The Council serves as well to facilitate contacts between scholars at UBC concerned with ocean research and other universities, government bodies, international agencies and other interested groups off-campus. While the Council has no role in teaching or the development of curricula it does act to develop interdisciplinary seminars on ocean topics for both faculty and graduate students.

Interested individuals wishing to contact this Council should forward their communication to the Dean of the Faculty of Graduate Studies for transmittal to the Council.

Oceanography

Professor and Acting Head: S. Pond.

Honorary Professor: W. M. Cameron.

Professors: R. J. Andersen, S. E. Calvert, R. L. Chase,

P. J. Harrison, M. C. Healey, P. H. LeBlond, A. G. Lewis,

T. F. Pedersen, F. J. R. Taylor.

Associate Professor: W. W. Hsieh.

Assistant Professors: S. E. Allen, K. Orians, L. Pandolfo.

Associate Members: P. Austin (Geography), R. M. Clowes

(Geophysics), K. A. Grimm (Geology), S. Hinch (Fisheries)

G. C. Hughes (Botany), M. T. Kelly (Pathology),

G. Lawrence (Civil Engineering), J. Smit (Microbiology),

D. Steyn (Geography).

Ph.D. and M.Sc. Degrees

A program of study in Oceanography was initiated at The University of British Columbia in 1949 in an Institute within the Faculty of Graduate Studies; Oceanography became a Department in the Faculty of Science in 1979.

Oceanography is concerned with the biology, chemistry, geology and physics of the sea. Many of the phenomena which occur can be understood only through the simultaneous application of more than one of these disciplines. Thus, oceanographic research often requires cooperative multidisciplinary studies by researchers whose training includes relevant aspects of the different scientific disciplines. The Department offers programs for the training of oceanographers in research and in the scientific background appropriate to resource surveying and management to meet the needs of the oceanographic community in government, industry and university.

The faculty also engage in fundamental research in oceanography, both independently and in cooperation with federal government laboratories. For such work access is readily available to many different oceanographic regimes occurring along the coast of British Columbia: fjords, the inland sea of the Strait of Georgia, the coastal region of the North Pacific, and the North Pacific Ocean itself. The types of oceanographic problems that can be

studied include: estuarine processes, satellite remote sensing, coastal upwelling, ocean circulation including modelling, plate tectonics, marine geochemistry, palaeoceanography, air-sea interaction, natural product chemistry, plankton ecology and physiology, and primary organic production of the sea. Field studies at sea are also carried out in other regions of the world's oceans.

Programs leading to both Ph.D. and M.Sc. degrees are offered. Students must satisfy the admission requirements of the Faculty of Graduate Studies and normally should have a Bachelor's or Master's degree in some area of science or applied science. The Ph.D. program consists of appropriate course work chosen in consultation with the candidate's Committee and the preparation of a thesis based on the results of original research. The M.Sc. program consists of six or 12 credits of thesis and 18 or 24 credits in course work, or 30 credits in course work and an essay.

Students in oceanography normally are required to take Oceanography 308, 309, 405 or 414, and 408 unless they have previously taken equivalent courses. Graduate students in physical oceanography will substitute Oceanography 514 for Oceanography 414, those in biological oceanography will substitute Oceanography 506 and/or 507 and/or 509 for Oceanography 309. Additional courses to complete the student's program will be chosen in consultation with the candidate's committee.

Students in Oceanography may select courses, depending on their interest, from the following areas of specialization:

- Biological Oceanography
- Chemical Oceanography
- Geological and Geophysical Oceanography
- Physical Oceanography and Atmospheric Sciences

Courses related to Oceanography are also offered in the Departments of Botany, Chemistry, Engineering, Geological Sciences, Geography, Geophysics and Astronomy, Physics and Zoology.

Oceanography students normally begin their studies in September but may sometimes arrange to start their thesis work in the summer before their first winter session. A student wishing to do graduate work in Oceanography should first discuss the proposed program with appropriate Faculty in the Department. Inquiries for further information should be sent to the Head.

Applications for admission are made to the Dean of Graduate Studies and should, if possible, be made before January 1 of the year the student wishes to enter. Later applications will be considered but may not be successful because of limited facilities.

Oral Biology

Professor and Head: D. M. Brunette.

Professors: A. G. Hannam, B. C. McBride, V. V. J. Uitto.

Associate Professors: R. M. Shah, J. D. Waterfield.

Assistant Professor: N. D. Rusc.

Associate Members: V. M. Diewert (Clinical Dental Sciences), H. Larjava (Clinical Dental Sciences), A. A. Lowe (Clinical Dental Sciences), C. M. Overall (Clinical Dental Sciences), J. M. Richman (Clinical Dental Sciences), C. B. Wu (Clinical Dental Sciences), E. H. K. Yen (Clinical Dental Sciences and Dean of Dentistry), L. Zhang (Oral Medical and Surgical Sciences).

Ph.D. Degree

The department offers the opportunity for advanced study in a number of areas related to oral biology including: oral and cellular immunology, basic and applied

biology of the cells and extracellular matrix of the periodontium, oral microbiology and immunology, biomaterials, craniofacial growth and development, teratology, oral sensorimotor function, craniofacial biomechanics and microbiological and biochemical assessment of caries and periodontal disease activity. The department has good research funding and is well equipped to carry out advanced research. Students will normally be required to take ORBI 500 (Research Methods and Seminars in Oral Biology), and either ORBI 501 (Craniofacial Biology) or ORBI 502 (Biology of Oral Tissues) during their first year. In addition students will be required to pass a comprehensive examination. The program will be open to those who have completed a D.D.S., D.M.D., M.D., D.V.M. or their equivalents, or a M.Sc. in Dental Science or a related discipline.

A booklet providing details on the program and describing current research projects is available on request from the Department. Please contact the Department of Oral Biology, Faculty of Dentistry, 2199 Wesbrook Mall, Vancouver, B.C. Canada, V6T 1Z3; telephone (604) 822-4186, fax (604) 822-6698, e-mail skibo@unixg.ubc.ca.

Pacific Affairs

Managing Editor: I. D. Slater.

Pacific Affairs, an international quarterly features articles on the political, economic, social and diplomatic problems of Asia and the Pacific. Each issue contains a comprehensive book review section.

Pathology and Laboratory Medicine

Professor and Head: B. M. McManus.

Professors: J. D. Anderson, A. P. Aitor, D. E. Brooks, A. M. Chung, J. E. Dimmick, A. C. E. Eaves, E. Evans, J. A. J. Ferris, J. Fröhlich, C. A. Fyfe, S. Gillam, W. J. Godolphin, D. F. Hardwick, J. C. Hogg, J. B. Hudson, D. K. Kalousek, G. Krystal, G. Lockitch, A. B. Magil, B. McManus, P. Middleton, M. G. Norman, D. A. Owen, H. Prichard, J. Rootman, J. A. Smith, F. Taket, A. Tingle, J. L. Wright.

Associate Professors: V. J. Baldwin, C. Carter, J. Chantler, N. Cimolai, K. Dorovini-Zis, G. Gray, J. Isaac-Renton, M. A. Noble, J. R. O'Kusky, D. W. Secombe, J. Tai, G. P. Taylor, J. Vielkind, H. Ziltener.

Assistant Professors: M. Allard, G. Bondy, S. Cassol, M. Daya, D. Devine, G. Dougherty, B. Gilks, S. Hayashi, R. Hegele, N. Kelly, L. A. Mitchell, M. Okazawa, C. Park, S. Porter, P. Riben, B. Walker, D. Walker, V. White.

Associate Members: D. A. Applegarth, N. Auersperg, J. L. Bert, N. Buskard, A. Chow, B. Conway, M. Coulter-Mackie, C. J. Eaves, K. Humphries, S. M. Innis, A. Junker, M. Kiess, P. A. Keown, F. R. G. Klingemann, S. Langlois, P. M. Lansdorp, D. M. Lyster, W. C. MacDonald, D. Matheson, H. F. Mizgala, J. Oger, P. Pare, R. Priddy, N. E. Reiner, J. W. Schrader, C. H. Scudamore, K. U. Seung, J. H. Tegenfeldt, R. Thies, W. J. Tze, J. Zhang.

Honorary Members: D. Brunette, W. L. Dunn, R. Durand, N. Farrell, K. Y. Lam, J. J. Lederman, G. M. Martin, A. Minchington, G. A. Montessori, P. Olive, B. Palci, R. Shah, L. Skarsgard, K. Skov, J. Tonzetich, A. E. W. Trites.

Ph.D. and M.Sc. Degrees

The Department offers training in a wide range of research areas, from basic investigation of biomedical phenomena at the molecular and single cell level using biochemical, immunological, molecular biological and physicochemical approaches, through studies on human developmental biology and clinical disease. As well as

working in laboratories on campus, students in the Department of Pathology and Laboratory Science are located in the Terry Fox Laboratories, the B.C. Cancer Research Centre, the Eye Center, the Research Centre at the Children's Hospital and all the UBC Faculty of Medicine Teaching Hospitals in the city. M.Sc. and Ph.D. degree programs, alone or combined with M.D. or residency training, are available. Acceptance into the graduate program is possible for students of high academic standing from diverse backgrounds. A prerequisite in biochemistry is normally required, but the necessary background can be obtained while registered in the Department.

Pharmaceutical Sciences

Professor and Dean: J. H. McNeill.

Professors: F. S. Abbott, J. E. Axelson, G. D. Bellward, J. Diamond, D. M. Lyster, S. Katz, K. M. MacLeod, K. M. McLernan, J. G. Sinclair.

Associate Professors: H. M. Burt, D. W. Fielding, P. J. Jewesson, M. Levine, J. M. Orr, R. Reid.

Assistant Professors: S. Amarsi, S. Bandiera, B. Carleton,

K. Curry, D. S. Hill, J. P. McCormack, G. P. Mencilly, R. Miller, K. W. Riggs, B. Rodrigues, P. J. Soja, R. Tsuyuki, K. Wasan.

Ph.D., M.Sc. and Pharm.D. Degrees

The Faculty of Pharmaceutical Sciences offers opportunities for advanced study leading to the degrees of Master of Science and Doctor of Philosophy in the fields of Biopharmaceutics, Clinical Pharmacy, Pharmaceutics, Pharmaceutical Chemistry (including Medicinal Chemistry), Pharmacology, Toxicology, Bionucleonics and Pharmacy Administration.

The program is open to those holding undergraduate or graduate degrees from recognized universities, whether in pharmacy or other related disciplines.

The Faculty of Pharmaceutical Sciences also offers opportunities for study leading to the Doctor of Pharmacy degree in the field of clinical pharmacy. This Pharm.D. program is open to applicants who possess a Bachelor of Science degree in Pharmacy or equivalent and are eligible for registration with the College of Pharmacists of British Columbia.

Course requirements for the Pharm.D. Degree

Year One

Course	Credits	
PHAR 501	12	Advanced Pharmacotherapeutics
PHAR 502	4	Advanced Concepts in Pharmacokinetics
PHAR 570	2	Physical Assessment
HCEP 506	3	The Design and Analysis of Clinical Trials
PHAR 508	4	Advanced Clinical Pharmacokinetics
PHAR 555	2	Seminar
HCEP 400 ¹	3	Statistics for Health Research (or equivalent)
PAT1 425 ²	8	Human Pathology
PHAR 551	3	Advanced Hospital Pharmacy Management
PAT1 415	2	Immunopathology

Year Two

Course	Credits	
PHAR 553	12	Clinical Clerkship I
PHAR 554	12	Clinical clerkship II
PHAR 555	2	Seminar
	-	Comprehensive Pharm.D. Examination

Total 69

¹ Equivalent courses: BIOL 300, STAT 200.

² Students will take systems pathology portion of course. Directed self-study will be undertaken in topics in General Pathology.

A detailed brochure is available from the Faculty of Pharmaceutical Sciences.

Pharmacology and Therapeutics

Professor and Head: C. van Breemen.

Professors: S. S. R. Bhagavattula, D. V. Godin, C. C. Y. Pang, E. Pui, D. M. J. Quastel, M. C. Surter, M. J. A. Walker.

Associate Professors: B. A. MacLeod, J. G. McLarnon, R. E. Rangno, R. A. Wall, J. M. Wright.

Assistant Professors: M. Bridges, A. P. Goumeniouk, T. Madden, R. Tabrizchi.

Associate Member: S. Sacks.

Ph.D. Degree

Facilities are available for original investigation in certain fields of pharmacology, including cellular, biochemical, autonomic, cardiovascular, clinical, and neuropharmacology. Pharmacokinetic and drug metabolism studies also can be arranged.

M.Sc. Degree

The prerequisite to the M.Sc. degree is an A.B.Sc. degree in Pharmacology or a related subject, or an M.D. degree.

Courses include Pharmacology 400 and 404, or their equivalents (if not already taken); a 12-credit Thesis; and courses in related fields selected in consultation with the Department.

Philosophy

Professor and Head: E. R. Winkler.

Professors: J. C. Dybikowski, M. McDonald, T. E. Patton, S. Savitt.

Associate Professors: P. Danielson, A. Irvine, J. P. Russell.

Assistant Professors: J. P. Stewart, C. Talmage, G. A. Wedeking.

Ph.D. and M.A. Degrees

The Philosophy Department offers courses of instruction leading to both the Master of Arts (M.A.) and the Doctor of Philosophy (Ph.D.) degrees in most major areas of the discipline, including epistemology, metaphysics, ethics, political and social philosophy, philosophy of language, logic, philosophy of science, philosophy of mathematics, and the history of philosophy. In conjunction with the University's Centre for Applied Ethics, the Department also offers special graduate streams in both its M.A. and Ph.D. programs in most areas of applied ethics, including biomedical ethics, environmental ethics, and business and professional ethics.

Prerequisites for the M.A. include either an Honours B.A. in philosophy or a B.A. or B.Sc. with at least one-term course in formal logic and sufficient upper division work in the history of philosophy, ethics and value theory, and metaphysics, epistemology, or the philosophy of science to enable the student to undertake graduate-level work in these areas.

Prerequisites for the Ph.D. include either an M.A. in philosophy, or an Honours B.A. with first class standing in Philosophy, or equivalent.

Physics

Professor and Head: B. G. Turrell.

Professors: I. Affleck, B. Ahlborn, E. G. Auld, D. A. Axen,

D. A. Balzarini, B. Bergersen, J. H. Brewer, J. F. Carolan,

M. K. Craddock, F. L. Curzon, J. E. Eldridge, E. Evans,

P. C. Gregory, H. P. Gush, W. N. Hardy, M. D. Hasnoff,

R. R. Johnson, G. Jones, W. H. McCutcheon, M. McMillan,

P. W. Martin, D. F. Measday, J. Meyer, A. Ng, I. Ozier,

R. R. Parsons, P. Rastall, C. F. Schwerdtfeger, G. Semenov,

W. L. H. Shuter, T. Tiedje, W. G. Unruh, N. Weiss,

B. L. White, D. L. Williams.

Honorary Professors: R. R. Haering, L. Skarsgard.

Associate Professors: D. S. Becher, G. W. Hoffmann, R. Howard,

W. Hsieh, R. Kiehl, A. MacKay, P. W. Matthews, C. Waltham,

L. Whitehead, J. Young.

Assistant Professors: D. Bonn, M. Halpern, C. Hearty,

J. McKenna, K. Schleich, P. Stamp.

Adjunct Professors: E. El-Khatib, H. Fearing, J. Ng, P. Olive,

B. Palcic, G. Smith.

Associate Members: R. Durand, G. K. Y. Lam (Pathology),

Q. S. Xiang (Radiology).

Canada International Fellows: O. Tirkkonen.

Ph.D. Degree

The Department offers opportunities for study in the following major fields:

- a) **Theoretical Physics**—Elementary particles
Statistical mechanics
Condensed matter
Intermediate energy nuclear physics
Properties of charged particle beams
Macroscopic quantum coherence phenomena
Gravitation
Properties of liquid crystals
Quantum field theory
Theory of disordered materials
Relativistic quantum mechanics
High Tc superconductivity
Magnetism
Cosmology
- b) **Astrophysics**—Observational and interpretive studies of the interstellar medium, star formation, galactic kinematics, dynamics and structure, variable radio sources, supernova remnants, extragalactic radio sources using various radio telescopes around the world. Experimental cosmology using balloons and sounding rockets.
- c) **Magnetic Resonance**—Application of NMR techniques to model and biological membranes. NMR in metallic crystals and ferromagnetic alloys and hyperfine interactions using nuclear orientation. Muon spin resonance at TRIUMF.
- d) **Plasma Physics**—High intensity laser-matter interactions. Laser fusion science including stimulated scattering, shock compression in solids and atomic physics of fusion plasmas. Laser physics and pulsed laser development. Numerical simulations. Laminar and turbulent flow in liquids. Thermodynamics of heat engines. Industrial applications of plasmas including material processing and display devices.
- e) **Nuclear and Particle Physics with the Tri-University Meson Facility (TRIUMF)**—On the UBC South Campus scientists from four universities (Alberta, British Columbia, Simon Fraser and Victoria) jointly collaborate in order to produce pions and muons. Also available is 100 nA of polarized protons, variable in energy from 180 MeV to 520 MeV. This beam can be used to produce an intense flux of polarized neutrons of about the same energy. Experiments are being performed on the fundamental properties of particles and nuclei together with studies of condensed matter using muons as a probe (μ SR). Experiments are also carried out at other laboratories (Brookhaven, CERN). Plans are being made for the KAON factory, which could be ready by 1998. A group is involved in the Sudbury Neutrino Observatory. A group is also active in electroweak and heavy flavour physics using the OPAL detector at CERN and B physics and CP violation studies at the SLAC B Factory.
- f) **Semiconductors**—Magnetron sputtering of epitaxial films and high Tc superconductors. Thin film hybrids. Growth of epitaxial films by molecular beam epitaxy. Quantum well diode laser fabrication, modelling and testing.
- g) **Low-Temperature Physics**—Studies of atomic hydrogen and deuterium at low temperatures. Spin-polarized H and D. Cryogenic Detectors. Nuclear orientation and NMR of oriented nuclei (NMRO), heavy fermion superconductor.
- h) **Spectroscopy**—Experimental cosmology. Forbidden rotational spectra. High resolution infrared studies. Laser spectroscopy and fluorescence studies. Stimulated scattering of light from gases and liquids.
- i) **Hyperfine Interactions**—The electronic structure of graphite intercalation compounds is studied using time-differential perturbed gamma-gamma angular correlations. Magnetic materials are also investigated using nuclear orientation, NMR of oriented nuclei, and μ SR.
- j) **Infrared Spectroscopy of Solids**—Fourier-Transform spectroscopy from the far-infrared to the visible. Analysis of vibrational bands and electronic transitions, including charge density waves and superconducting energy gaps. Study of organic and high Tc superconductors, as well as semiconductor heterostructures at temperatures from 2 K to 300 K.
- k) **Critical Phenomena**—Experimental investigations by optical means of the critical regions of pure fluids, binary fluids, and liquid crystals. Interferometric and light scattering techniques are used to measure the parameters which characterize these fluids near phase transitions.
- l) **Biophysics**—Cancer research in radiation biophysics. Diagnostic use of doppler shift in scattered light to measure blood flow in retinal vessels. NMR photoluminescence and mechanical properties of membranes. Modelling of self-organizing and self-regulating biophysical systems (e.g. the immune system). The physics of soft natural materials and bio-interfaces.
- m) **Physics at High Pressure**—Matter under extreme conditions: transport properties, equations of state and phase transitions at high pressure and high temperature. Laser-driven shock waves in solids. Hypervelocity impact phenomena. Diamond anvil cells for static high pressure studies.
- n) **High Tc Superconductivity**—Fundamental and applied studies of high Tc superconductivity. Synthesis of single crystal and polycrystalline materials. Thin films produced by magnetron sputtering, electron beam evaporation and laser ablation. Theory, muon spin rotation (μ SR), transport properties, microwave resistivity, NMR, magnetic measurements, heat capacity superconductivity devices.
- o) **Surface Physics**—Scanning tunnelling microscopy in air and ultra-high vacuum. Photoelectron spectroscopy of surfaces and interfaces with synchrotron radiation.
- p) **Structured Surface Physics**—Studies of solid/liquid interfaces containing precision structures on a size scale of 0.1 to 100 μ m. Polymeric micro-replication methods allow new phenomena to be studied. Micro-prismatic structures yield efficient new optical reflectors and absorbers. Different micro-structures can enhance breakdown fields in gases, yielding pow-

erful broad-band transducers. Further research includes control of solid/liquid interface energy, and modification of flow turbulence.

A brochure describing the research facilities in more detail is available on request from the Department of Physics.

M.Sc. Degree

Prerequisite: Honours in Physics (single or combined) or Mathematics; or Bachelor's degree with at least upper Second Class (72%) standing in Engineering Physics; or Bachelor's degree with a Physics Major, with First Class standing.

M.A.Sc. Degree (Engineering Physics)

Prerequisite: Graduation in Engineering Physics or Electrical Engineering.

Both the M.Sc. and M.A.Sc. programs require a minimum of 30 credits with the thesis counting 12 credits and normally at least 12 credits from graduate courses in physics, although for those students interested in interdisciplinary fields this may be reduced to eight credits with permission of the department.

Ph.D. Degree

Prerequisite: Master of Science in Physics, or Master of Applied Science (or Engineering) in Engineering Physics. After a year's residence at UBC and 18 credits in course work with an overall first class average and clear evidence of research ability, well-qualified M.Sc. or M.A.Sc. candidates may be transferred directly to a Ph.D. program. The Physics Department requires a further 12 credits of course work in the Ph.D. program.

Physiology

Professor and Head: K. G. Bambridge.

Professors: A. Buchan, J. R. Leidsome, C. H. S. McIntosh, J. A. Pearson, R. A. Pederson.

Associate Professors: N. Kasting, D. A. Mathers, P. C. Vaughan, Y. N. Kwok.

Assistant Professors: C.-A. M. Coumeya, K. Curry, S. Kehl, E. Moore.

Associate Members: M. S. Cynader, J. Church, R. M. Douglas, P. C. K. Leung, M. Meloche, G. A. Quamme, D. W. F. Schwarz, C. Shaw, S. Vincent, P. B. Reiner.

Ph.D. Degree

The Department offers opportunities for advanced study and research in many branches of vertebrate physiology, and is particularly strong in the areas of neurophysiology, gastroenterology, endocrinology and cardiovascular physiology. A brochure describing the research activities in more detail is available upon request from the Department.

Prerequisite: A M.Sc. degree in Physiology or closely related field; a B.Sc. degree with First Class Honours in Physiology; or an M.D., D.M.D. or D.V.M. degree with adequate standing and approval by the Head of the Department.

M.Sc. Degree

Opportunities for research training as above.

Prerequisite: A B.Sc. degree with standing in Physiology or a related subject defined by the Faculty of Graduate Studies; or an M.D., D.M.D. or D.V.M. degree.

Courses: Physiology 422, 423, 424, 426 and 430 or their equivalents if not already taken; plus a minimum of 12 credits at the 500 level, and thesis (12 credits).

Planning

See Community and Regional Planning.

Plant Science

Professor and Head: B. E. Ellis.

Professors: G. W. Eaton, F. B. Holl, M. B. Isman, P. A. Jolliffe, J. H. Myers, V. C. Runckles.

Honorary Professors: R. A. Forbes, H. MacCarthy, R. Stace-Smith, M. Weintraub.

Associate Professors: R. J. Copeman, J. Kronstad, M. D. Pitt, M. K. Upadhyaya.

M.Sc. and Ph.D. Degrees

The Department offers advanced study in applied plant biology, with a commitment to development of sustainable managed ecosystems. Our discipline strengths in plant physiology, biochemistry, molecular biology and ecology are focussed on applications in agronomic and horticultural crops, as well as range and weed species. Research topics include environmental plant physiology, plant pathology, virology, plant competition, plant and insect biotechnology, biological controls, as well as range and wildlife habitat management.

Modern laboratories, greenhouses and research field plots are available, as well as specialized equipment such as controlled environment growth chambers, gas analyzers, radioisotope suite, tissue culture facilities, high performance liquid chromatography stations, and gas chromatographs, recombinant DNA laboratory, and an insectary. The resources of the UBC Biotechnology Laboratory also provide state-of-the-art support for appropriate research projects. Research conducted with Adjunct Professors at other institutions (Agriculture Canada Research Stations in Vancouver, Agassiz and Summerland; UBC Botanical Garden; BC Research Corp.) is able to make use of excellent specialized facilities at those sites.

Research programs that address problems through an interdisciplinary approach involving other Departments (e.g., Soil Science, Botany, Zoology, Microbiology, Forest Science) are strongly encouraged.

Courses

Prerequisites: A Bachelor's degree (at least high second class standing) with courses in fields of study acceptable to the Department.

In addition to the Ph.D. program, the Department offers two M.Sc. programs in Plant Science: the M.Sc. with Thesis and the M.Sc. with Comprehensive Examination. Both are available to part-time students. Within the Department, the Program in Landscape Architecture also offers a Masters degree in Landscape Architecture (M.L.A.), which is described separately. (See Index for page number.)

Polar and Alpine Research

Committee: P. Suedfeld (Chair), S. Grace, G. Henry,

P. Hochachka, L. Lavkulich, S. Ray, W. Rees, T. Sinclair.

There are a number of individuals at The University of British Columbia involved in research in Polar and Alpine areas. A Committee on Polar and Alpine Research coordinates the activity, funding and mutual interests of this group. At present the university's efforts involve anthropology, literature, biology, geography, geology, glaciology, history, planning, and psychology, in both Alpine and

Polar (Antarctic and Arctic) environments. Current areas of special interest to the Committee are the Western Arctic including Yukon Territory, parts of the Northwest Territories including the High Arctic, Antarctica, and high altitude work in British Columbia. The Committee sponsors lectures, provides a unified group to approach granting bodies, and a means whereby interested faculty and graduate students may exchange Polar and Alpine information.

Political Science

Professor and Head: D. E. Blake.

Professors: H. A. C. Cairns, D. J. Elkins, G. A. Feather, I. Head, K. J. Holsti, R. H. Jackson, B. Job, R. G. C. Johnston,

P. Resnick, P. R. Tennant, M. D. Wallace, M. W. Zacher.

Associate Professors: P. A. Busch, R. K. Carty, G. Hoberg, Jr., S. V. LaSelva, P. J. Marantz, D. K. Mauzy, J. R. Wood.

Assistant Professors: H. B. Chamberlain, A. Eisenberg, K. Harrison, K. A. Park, A. Staroff.

Ph.D. and M.A. Degrees

The Department offers opportunities for advanced study in the major fields of Political Science. It is a major centre for the study of Canadian politics; eleven members of the Department are actively engaged in research touching on Canadian themes. At present the National Election Study is centred in the Department, and a Department member holds the Brenda and David Mclean Chair in Canadian Studies.

The University is also one of North America's leading centres for Asian studies, having excellent library resources and strong Asian offerings in a number of disciplines. The Department has specialists for China, Japan, Korea, Southeast Asia, and South Asia; Asia is emphasized in comparative politics seminars. The Department has especially close connections with the journal, *Pacific Affairs*, which is published on campus. The Asian specialists also interact with the Institute of Asian Research and its regional centres (one of which is chaired by a professor jointly appointed to the Department). The Faculty offer seminars on political development, cleavages and integration, ethnicity, Asian political systems, and theoretical approaches to political comparison.

The Department has special interests and expertise in the area of international relations and international security studies. Jointly with the UBC Institute of International Relations, whose director and past director are Department members, the Department is awarded yearly grants by the Department of National Defence as a centre of expertise under its Military and Strategic Studies Program.

The Department also promotes research and teaching in political theory, political economy, research methodologies, public policy

especially environmental policy, and comparative politics outside Asia, including Russia and the Commonwealth of Independent States, Europe, the United States, and Australia.

The library is a depository for United Nations, Canadian Government, British Columbia Government, and most U.S. Government documents. The library is especially strong in Soviet and Communist Studies, Asian Studies, and Canadian Government. The University is a member of the Inter-University Consortium for Political Research (Ann Arbor), and belongs to the International Survey Library Association (Storrs, Ct.). Computer facilities are available; the Data Library has the largest collection of machine-readable material in Canada.

Ph.D Program

The basic requirements are six three-credit seminars in the first year, two comprehensive examinations in the second year, a thesis prospectus in consultation with a supervisor and committee, a dissertation and oral defence. As a general rule, the Department requires that applicants to the Ph.D program have an undergraduate concentration in political science and an M.A. in Political Science. Criteria for admission include outstanding previous performance, research interests compatible with the Department's offerings, and strong letters of reference indicating a high likelihood that the student will be able to contribute to the discipline.

M.A. Program

For full-time students this is a one-year program. As a general rule, the Department will not accept for admission students with an overall grade point average of less than 75% (B+) in their final two years or who have fewer than 30 credits of senior third/fourth year political science courses. The basic requirements include six three-credit seminars, a thesis of a maximum of 100 pages, and an oral defence of the thesis.

The M.A. Program is also available on a part-time basis. A detailed brochure is available on application to the Department. Contact the Graduate Secretary, telephone: (604) 822-2717, fax: (604) 822-5540.

Poultry Science

See Animal Science.

Psychology

Professor and Head: A. G. Phillips.

Professors: D. J. Albert, L. Alden, M. Chandler, S. Coren, K. D. Craig, D. G. Dutton, B. Gorzalka, R. Hakstian, R. D. Hare, J. P. J. Pinel, S. J. Rachman, J. A. Russell, J. Steiger, P. Suedfeld, R. C. Tees, L. Walker, L. Ward, J. Werker, J. Wiggins, D. M. Wilkie, R. Wong, J. Yuille.
Associate Professors: D. S. Butt, J. Campbell, R. S. Corteen, A. Delongis, E. Eich, J. T. Enns, P. Graf, C. Johnston, D. R. Lehman, W. Linden, D. Papageorgis, D. L. Paulhus, C. H. Rankin, T. MacBeth Williams.
Assistant Professors: R. L. Collins, G. Hall, P. Hewitt, G. J. Johnson, F. Valle.

Ph.D. and M.A. Degrees

The Department offers opportunities for advanced study in the following areas of specialization:

- | | |
|-----------------------------|------------------|
| a) Biopsychology | f) Personality |
| b) Clinical | g) Social |
| c) Developmental | h) Environmental |
| d) Forensic | i) Psychometrics |
| e) Perception and Cognition | |

The graduate program in psychology provides exposure to ongoing research projects in each of its areas of specialization (see above). M.A. and Ph.D. degrees are awarded only to those students who acquire: (1) a detailed knowledge of the current research findings in their area of specialization, (2) a knowledge of the concepts and issues in other selected areas of psychology and (3) the ability to conduct original research of high quality. In addition to the above requirements, clinical students (the program is fully accredited by both A.P.A. and C.P.A.) must develop an acceptable level of clinical skill, and must serve a one-year internship in an approved applied setting as part of their Ph.D. A brochure describing the psychology graduate program in more detail can be obtained by writing to the psychology graduate secretary. Also available from

the same source are brochures providing detailed information concerning each of the areas of specialization.

Pulp and Paper Engineering

Program Coordinator: P. Englezos, Chemical Engineering.
Associate Program Coordinator: C. Bennington, PAPRICAN.
Board of Study: M. S. Davies (Electrical Engineering); M. E. Salcudean (Mechanical Engineering); R. W. Kennedy (Forestry); D. Tromans (Metals and Materials Engineering); R. M. R. Bramion (Chemical Engineering); G. Dumont (Electrical Engineering); P. Englezos (Chemical Engineering); K. L. Pinder (Chemical Engineering); R. J. Kerekes (PAPRICAN); C. P. J. Bennington (PAPRICAN), and two student representatives.
Ex Officio: D. Thompson (Chemical Engineering); J. R. Grace (Faculty of Graduate Studies).

M.Eng. Degree

A program in pulp and paper engineering leading to an M.Eng. degree is offered to qualified engineering graduates seeking to acquire postgraduate training for the practice of engineering in the pulp and paper industry. The program is designed primarily for students with at least two years experience in the pulp and paper industry, or summer experience and courses in pulp and paper technology equivalent to Chemical Engineering 470 and 471.

Prerequisite: Graduation or equivalent in Chemical Engineering, Electrical Engineering, Mechanical Engineering, or Metals and Materials Engineering. Graduates from other branches of engineering may be accepted on approval by the program coordinator.

Program: Required courses are 14 credits in graduate pulp and paper courses, four credits in lab courses, six credits of technical electives plus six credits and a project with a report in a field of specialization. Present fields of specialization are Project and Maintenance Engineering, Process Engineering, Systems and Control and Environmental Engineering.

This program is offered in collaboration with the Pulp and Paper Research Institute of Canada.

Rehabilitation Sciences

Director: A. Belecstro.
Professor: S. Harris.
Associate Professors: E. Dean, L. Jongbloed.
Assistant Professors: I. Dyck, D. Reid.
Associate Members: H. Anton, R. W. Armstrong, C. Backman, B. L. Beattie, C. Carpenter, S. Hashimoto, M. McCuatig, S. Stanton, M. Suto, H. Tuokko.

M.Sc. Degree

The M.Sc. program is designed to prepare individuals to conduct clinical research independently and in collaboration with other scientists. Students will investigate an area of knowledge within their respective rehabilitation discipline and develop skills that permit a critical analysis of problems which can be directly related to clinical practice. Three areas of concentration are offered which will lead to advanced understanding of rehabilitation practice, including Cardiopulmonary and Motor Performance, Neuromotor and Neurological Conditions, and Chronic Illness and Disability. Study and identification of clinical problems in an area of concentration will prepare the student to investigate critical questions of importance to rehabilitation practice.

The program may be pursued by full or part-time students. Full-time study would normally require approxi-

mately 24 months, including completion of the thesis. A minimum of thirty (30) credits is required for the degree. This consists of 18 credits of required coursework in the School of Rehabilitation Sciences at the 500 level, which includes six hours of credit for thesis. Twelve hours of elective credit are also required, and these may be selected from courses offered within the School or from other academic units. At least six of the elective credits must be at the 500 level or above.

The specific courses taken will depend on the area of concentration chosen. Each student will be assigned an adviser appropriate to her/his area of concentration and must have a plan of study approved by the Adviser and/or Head, Division of Graduate Studies. Core courses include:

RHSC 500	Advanced Concepts for Rehabilitation Research
RHSC 502	Rehabilitation Theory
RHSC 504	Directed Studies

Plus one of the following depending upon the chosen area of concentration:

RHSC 515	Exercise Physiology and Metabolism in Disease and Injury
RHSC 510	Disability: Social, Economic and Political Influences
RHSC 520	Neurorehabilitation

Minimum admission requirements include a degree in occupational therapy, physical therapy, or a related rehabilitation profession, an academic record which meets the requirements of the Faculty of Graduate Studies, and completion of an introductory course in research methods and statistics (equivalent to RHSC #02). Preference will be given to applicants who hold degrees in occupational or physical therapy, are qualified to practice their rehabilitation profession in British Columbia, and who have had recent clinical experience providing rehabilitation care.

Persons interested in applying to the program should request additional program and application information from the School of Rehabilitation Sciences.

Religious Studies

Associate Professor and Head: P. G. Mosca.
Professors: H. E. Kassir.
Associate Professors: C. P. Anderson, R. Menkis (Graduate Adviser).
Instructor: P. Burns.
Lecturers from other Departments: A. Aklujar (Asian Studies), D. L. Baker (Asian Studies), H. S. Oberoi (Asian Studies), D. L. Overmyer (Asian Studies).

M.A. Degree

The Department of Religious Studies offers courses leading to the degree of Master of Arts. Candidates may choose any one of the following areas of concentration: Religions of South and East Asia; Biblical Studies; Judaic Studies; Christian Thought and Institutions; Islamic Studies; History of Religion. The candidate may select a program with thesis (30 credits in course work, including 12 credits for thesis) or without thesis (30 credits in course work, in addition to comprehensives and major essay). A competent reading knowledge of the appropriate languages must be acquired before writing the thesis or comprehensives and major essay.

Further information regarding the M.A. is available on application to the Department. Brochures describing the program in more detail are also available on request.

Remote Sensing Council

Chair: P. A. Murtha (Forestry and Soil Science)
 Council Members: P. Austin (Geography); I. Cumming (Electrical Engineering); Wm. Hsieh (Oceanography); B. Klinkenberg (Geography); M. Ito (Electrical Engineering); A. K. Mackworth (Computer Science); W. Savigny (Geology); H. Schreier (Soil Science); R. J. Woodham (Forestry and Computer Science).

Graduate Programs with Specialty in Remote Sensing

Studies in various aspects of remote sensing leading to either Master's or Ph.D. degrees in Forestry, Computer Science, Electrical Engineering, Geography, Geology, Geophysics and Astronomy, Oceanography or Soil Science are coordinated by the Council on Remote Sensing.

Students enter the program by admission as a Master's or Ph.D. candidate in one of the above. The discipline department and the student's committee chair are selected from the Department or Faculty which represents the student's primary field of interest. Students are encouraged to seek representation on their committee from other University departments. In consultation with their committee, specialized programs of study can be developed for highly motivated and well qualified individuals in any aspect of remote sensing, or in any application of remote sensing technology. Similarly, specialized research programs can be developed to suit a student's interest area and can range from theoretical development of remote sensing technology (including image analysis and sensor development) to specialized application of remote sensing (including geographic information systems [GIS], vegetation and land classification, land use analysis, and oceanographic studies).

Remote Sensing research facilities are housed in the various associated departments and include a wide range of modern equipment which is continually being updated. Scholarships, fellowships, and teaching and research assistantships are available for eight and twelve month periods.

Additional information on graduate studies in remote sensing can be obtained directly from the Faculty of Graduate Studies or from the Chair of the Council on Remote Sensing. Answers to more specific questions on research direction in the various disciplines relative to remote sensing may be obtained directly from the departments and individual Faculty members concerned.

Resource Management and Environmental Studies

Committee: L. M. Javkulich (Chair), A. D. Chambers, P. Bradley, P. N. Nemetz, M. G. Reed, H. E. Schreier.

Ph.D., M.A. and M.Sc. Degrees

Graduate degrees in resource management are available in a number of disciplinary units at the University of British Columbia. To understand and deal with many problems that confront resource managers and scientists, a breadth of knowledge is required that is unprecedented in the history of environmental resource use. The Resource Management and Environmental Studies program objective is to aid students to develop an understanding of the biophysical, social, and economic dimensions of natural resources. The Resource Management and Environmental Studies program advises interdisciplinary students of options in resource management and environ-

mental studies and co-ordinates and supervises their programs.

Students entering come from diverse backgrounds; individual and flexible programs of study are designed to take previous training and interest into account. Students are required to take core Resource Management and Environmental Studies courses, as well as courses to be approved by the supervisory committee and Chair. Acceptance into the program is dependent upon:

- 1) meeting the admission requirements of the Faculty of Graduate Studies;
- 2) submission by the student of a thesis proposal acceptable to the Resource Management and Environmental Studies Committee; and,
- 3) acceptance by a faculty member willing to act as the student's supervisor.

Also, the program serves as a mechanism of graduate education and training in interdisciplinary research units at the University, including the Fisheries Centre, Sustainable Development Research Institute, and Westwater Research Centre.

Program Requirements

For the Master's degree, 36 credits is the minimum requirement for graduation:

Required Courses	12
Electives	12
Research Thesis	12
Total	36

The student's previous academic background, the choice of electives, and the focus of the research thesis determine whether the M.A. or M.Sc. program is followed.

For the Doctor of Philosophy degree, all candidates must complete Resource Management and Environmental Studies 500, 501, and 502 (or equivalent). The remainder of the academic program is determined by the candidate and the supervisory committee.

Part-time study or program without thesis is not encouraged.

Admission

In addition to the usual requirements stated by the Faculty of Graduate Studies, each applicant is required to submit a thesis prospectus or statement outlining the issue to be addressed, the relevance of the issue, the objectives of the research, and proposed methods.

The completed application will be considered by an Admissions Committee (chaired by the Program Chair). This committee will make recommendations to the Dean, Faculty of Graduate Studies. Foci for applicants include: ecological policy analysis, aquatic resources, land management, riparian and coastal environments, natural resource dynamics, alternate energy resources, wilderness conservation and management, and anthropogenic effects on environment and resource use.

Science, Technology and Society Studies

Coordinator: S. Straker (History).

Please direct all inquiries to the Coordinator.

Social Work

Associate Professor and Director: E. Stolar.
 Professors: C. Christensen, D. Freeman.

Associate Professors: K. McCannell, M. Russell.
 Assistant Professors: B. Carter, E. Kruk, P. McNicoll, R. Seebaran, R. Sullivan, F. Tester, S. Manson-Singer.

M.S.W. Degree

The School offers advanced studies in social work with an emphasis on clinical practice and/or social development. The M.S.W. program involves a minimum of 33 credits of which six credits are required in each of the following areas: 1) theoretical foundations, 2) research, 3) practice, and 4) thesis or directed field studies. Normally, studies are available in the following areas: social work and social welfare theory; social work research; practice with families and children; social work practice in mental health; social group work, and community development. Students may also take courses outside the School to a maximum of 15 credits to meet their learning objectives.

General admission requirements include a Bachelor's degree equivalent to the B.S.W. of the University. Other factors considered are: competitive academic standing, plan of study, experience in the social welfare field, and letters of reference. Applicants with exceptional qualifications, including a degree in a related discipline, may be considered on an individual basis for provisional admission. Completion of the program normally requires a minimum of twelve months of full-time studies, beginning in September. Part-time study consisting of a minimum of 12 credits per year is available. Students entering the M.S.W. Program normally must have completed courses in research methods and statistics.

The School also participates in a doctoral program of individual Interdisciplinary Studies which is offered by the Faculty of Graduate Studies. Acceptance is contingent upon excellent academic performance and the development of an interdisciplinary research proposal acceptable to the Faculty of Graduate Studies. Students holding an M.S.W. degree typically require undergraduate and advanced courses in other disciplines in order to prepare such a proposal.

Brochures from the School's Admissions Office provide more specific information on graduate programs, including admission requirements and procedures, course and degree requirements, faculty interests and specializations.

Sociology

Professor and Head (Anthropology and Sociology): R. Pearson.
 Professors: Y. Chang, B. Elliott, M. Foschi, N. Guppy, M. P. Marchak, R. S. Ratner.
 Associate Professors: D. Currie, G. Creese, T. Fernando, G. Johnson, D. Schweitzer, K. Stoddart.
 Assistant Professors: G. Gray, F. Kay, D. Tindall (joint appointment with Forestry).
 Senior Instructor: J. O'Connor.

See also Anthropology listing.

Ph.D. and M.A. Degrees

Studies in the M.A. and Ph.D. programs in Sociology normally are available in the following areas of study:

- | | |
|-------------------------------------|---------------------------|
| 1) Sociological Theory | 7) Social Interaction |
| 2) Research Methods | 8) Sociology of Knowledge |
| 3) Community Studies and Demography | 9) Work and Industry |
| 4) Deviance and Social Control | 10) Canadian Society |
| 5) Social Change and Development | 11) Political Sociology |
| 6) Social Inequality | |

The M.A. program which is available to both full-time and part-time students, requires a thesis and courses which include sociological theory and research methods. The prerequisite for the Ph.D. program normally is a Master's

degree in Sociology, which includes preparation in sociological theory and in research methods. Superior M.A. candidates may seek transfer to the Ph.D. program after the first year of graduate work has been completed. The Ph.D. program includes courses, comprehensive examinations, and a dissertation.

Research facilities in sociology include social survey and small groups laboratories. There is ready access to the University Computing Centre, Arts Computing for statistical and programming assistance, the Data Library for data archives, and specialized Asian Studies libraries and facilities.

More detailed information can be requested from the Department's Admissions Officer.

Soil Science

Professor and Acting Head: B. E. Ellis.

Professors: T. M. Ballard, T. A. Black, L. M. Lavkulich, L. E. Lowe, P. A. Murtha, H. E. Schreier.

Associate Professors: A. A. Bomke, M. D. Novak.

Ph.D. and M.Sc. Degrees

The Department offers opportunities for advanced study in the fields of Soil Chemistry and Mineralogy, Soil Organic Matter, Soil Physics, Biometeorology, Soil Pollution, Soil and Water Conservation, Soil Genesis and Classification, Land Use and Land Classification, Forest Soils, Soil Fertility, Soil Biology, and Remote Sensing. The Department's laboratories are well-equipped for research in these fields and access is available to major equipment installations in other Departments. Excellent library facilities are available in Soil Science and related fields. The Province of British Columbia is an unexcelled outdoor laboratory for the study of soils and the Department's close association with the Agriculture Canada Land Resource Research Centre, British Columbia Ministry of the Environment, and related programs facilitates taking advantage of this for advanced study. The University Research Forests operated by the Faculty of Forestry are also available for Soil Research.

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 12 credits of approved courses in Soil Science, may take them concurrently with the Master's program.

South Asian Research, Centre for

Executive Committee: J. Wood (Political Science, Chair), T. Beck (Institute of Asian Research), M. Bose (Comparative Literature), K. Hacker (Fine Arts), B. Morrison (Asian Research).

See Asian Research, Institute of.

Southeast Asian Research, Centre for

Executive Committee: G. Hainsworth (Economics, Chair), K. Griffiths (Geography), T. Hellwig, (Asian Studies), M. Leaf (Human Settlements), P. Nemetz (Commerce and Business Administration).

See Asian Research, Institute of.

Spanish

Ph.D. and M.A. Degree

See Hispanic and Italian Studies.

Statistics

Professor and Head: H. Joe.

Professors: A. J. Petkau, M. Schulzer, J. V. Zidek.

Associate Professors: N. E. Heckman, B. Jorgensen, J. Liu, R. H. Zamar.

Assistant Professors: B. Clarke, J. Meloche.

Associate Members: P. De Jong (Commerce), P. E. Greenwood (Mathematics), B. McCabe (Commerce) M. L. Puterman (Commerce).

Ph.D. and M.Sc. Degrees

The program leading to the degree of Master of Science is designed to prepare the student for employment in government and industry or to serve as preparation for students planning to undertake a program leading to the Ph.D. degree. The studies leading to the degree of Doctor of Philosophy are designed to equip the student to carry out research, with a view toward a career in academia, industry or government. Research interests of the faculty include medical statistics and clinical trials, applied probability models, mathematical modelling of biological systems, reliability theory, theory of statistical inference, asymptotics, conditional inference, generalized linear models, multivariate analysis, robustness, sequential methods, nonparametrics, design of experiments, time series, image processing and Bayesian methods. Students should consult the brochures, available from the Department, containing descriptions of courses and of programs as well as information on financial aid and application forms.

Surgery

Professor and Head: R. J. Finley.

Director (M.Sc. Program): Y. N. Hsiang.

Professors: I. G. M. Cleator (General Surgery), R. J. Finley (Cardiovascular and Thoracic), J. K. MacFarlane (General Surgery), M. D. Morrison (Otorhinolaryngology), B. Nelenis (Cardiovascular and Thoracic), D. W. F. Schwarz (Otorhinolaryngology), G. F. O. Tyers (Cardiovascular and Thoracic).

Associate Professors: D. B. Allardyce (General Surgery), D. D. Cochrane (Neurosurgery), N. L. Davis (General Surgery), F. A. Durity (Neurosurgery), A. D. Forward (General Surgery), R. M. Meloche (General Surgery), A. K. Qayumi (Cardiovascular and Thoracic), C. H. Scudamore (General Surgery), A. M. Seal (General Surgery), P. Steinbok (Neurosurgery), L. D. Sullivan (Urology), I. M. Turnbull (Neurosurgery), J. A. Vestrup (General Surgery).

Assistant Professors: D. J. Courtemanche (Plastic Surgery), G. Fradet, (Cardiovascular and Thoracic), M. Gleave (Urology), Y. N. Hsiang (Vascular), W. Jia (Neurosurgery), J. Kestle (Neurosurgery), M. Pezim (General Surgery), P. T. Phang (General Surgery), T. Zwimpfer (Neurosurgery).

M.Sc. Degree

The Department of Surgery offers opportunities and facilities for full-time study leading to the degree of M.Sc. in Surgery. Applicants must satisfy the normal admission requirements of the Faculty of Graduate Studies and must be acceptable to the Department of Surgery's Graduate Studies Committee. Prerequisites for application are: M.D., M.B., D.M.D., D.V.M. or equivalent. A candidate's pro-

gram will be determined by the program director in consultation with the candidate's supervisor. A supervisory committee will be chosen to represent the area of specialization elected by the candidate. The M.Sc. Program consists of a six, 12 or 18 credit thesis (SURG 549) plus 24, 18 or 12 credits of course work to give a total of 30 credits. Twelve credits of course work must be at the 500 level, of which eight credits should be from the Department of Surgery courses 502-548. For descriptions of these courses see Surgery under "Courses of Instruction" section of the *Calendar*. The candidate, with the advice of the committee, may select other approved courses in related fields. Further information may be obtained from the M.Sc. Program Director, Department of Surgery.

Sustainable Development Research Institute

Director: J. Robinson (Geography).

Assistant Directors: H. Kimmins (Forest Sciences),

L. Lavkulich (Chair: Resource Management and Environmental Studies, Professor: Soil Science).

Professor: D. Suzuki

The Sustainable Development Research Institute at UBC was established in 1991. The formation of the Institute responded to recommendations made by Dr. David Strangway in his role as Chair of the British Columbia Task Force on Environment and Economy and as presented in the report "Sustaining the Living Land" (June, 1989).

The aim of the Institute is to initiate and contribute to multidisciplinary research on the linkages between the environment, the economy and social equity. The Institute is intended to provide a vehicle for development and coordination of sustainable development initiatives on campus and a process for encouraging interdisciplinary collaboration among the faculties, departments and centres at UBC undertaking environmental research. The Sustainable Development Research Institute coordinates proposed and ongoing program activities, providing intellectual direction and an administrative overview. Research proposals from faculty members are passed through a review process and, if supported, are then submitted for external funding. Although the Institute does not currently offer programs of study, it does advise graduate students about interdisciplinary environmental research and relevant programs of study.

The Institute reports to the Dean of the Faculty of Graduate Studies, and is overseen by a Steering Committee of Deans from Faculties involved (Agricultural Sciences, Applied Science, Arts, Commerce and Business Administration, Forestry, Graduate Studies, Science). There is also an Advisory Council, consisting of senior representatives from business, government and academia.

Theatre and Film

Professor and Head: J. Wright.

Professor: E. Durbach, P. Loeffler, J. Wasserman.

Associate Professors: N. Freeman, C. Gallagher, R. Gardner,

R. Hall, J. Newton, J. Selman, C. Siegel.

Assistant Professors: C. Burnett, F. Fedoruk, A. Green,

B. McIlroy, S. Malloy, G. Murphy.

Ph.D., M.A. and M.F.A. Degrees

The Department offers opportunities for advanced studies leading to the M.A. and Ph.D. degrees in Dramatic Literature, Theatre History and Criticism.

The Department also offers advanced studies leading to the M.F.A. degree in the Direction of Plays and Production, and in the Design of Scenery and Costume.

In co-operation with the Department of Creative Writing, the Department offers M.F.A. programs in Stage- and in Screen-Playwriting. (For details of these programs, see Creative Writing in this section of the *Calendar*.)

In the Film Studies program, the M.A. degree is offered in history/theory/criticism and the M.F.A. in production. Each is a two-year course of studies and requires, as a prerequisite, an undergraduate degree in film studies or the equivalent.

The Department has a diversified program in both practical theatre and the academic study of dramatic literature, history and criticism. Regular productions, directed by faculty and by graduate students, are presented in the Frederic Wood Theatre and in the Dorothy Somerset Studio. There is opportunity for participation in all aspects of production.

Library resources are constantly expanding from the present collection of approximately 30,000 works of dramatic literature and books on theatre, and more than 70 periodicals. There are almost 500 recordings of drama in the Wilson Library.

The library has an extensive holding of film studies literature, and the department has a generous pool of equipment as well as a small library of films for bench examination.

Further information about graduate programs can be obtained from the Department's Graduate Handbook.

Transportation Studies, Centre for

Director: T. D. Heaver, UPS Foundation Professor (Commerce and Business Administration).

The Centre encourages transport research, supports students majoring in transportation, and sponsors a variety of seminars, symposia and other programs. It brings distinguished visitors to the campus for short programs, for an academic term, or for a year.

The Centre encourages research in a variety of areas, both academic and problem-centred. Some of its research deals with specific transport modes, business-government relations, regulation, socio-economic problems and transport planning together with its many ramifications. Much of the research is inter-disciplinary. Some research projects are sponsored by the provincial government, the federal government or other government agencies. These projects generally afford graduate students opportunities to do research work which is significant to Canada or to the world economy.

Transportation courses are offered in several university departments and professional schools including Commerce and Business Administration, Community and Regional Planning, Civil Engineering, Economics, and Geography. Students interested in working towards degrees should enrol in one of these departments.

There is an active demand for well-qualified graduates who have majored in transport. The Centre cooperates with prospective employers and with the University Placement Service in placing UBC graduates.

Urban Studies

Chair: W. Hardwick (Geography).

Urban studies are the concern of many university departments and professional schools: Architecture, Community and Regional Planning, Civil Engineering (Transportation), Commerce and Business Administration (Land Economics), Geography, History, Political Science, and Sociology, but this list is not exhaustive.

Students interested in a Master's Degree should enrol in any one of these departments, and make arrangements for courses and faculty representation on their research committee from other University departments. These arrangements are made through the department in which the student is enrolled, but the Chair of the Graduate Subcommittee on Urban Studies will provide initial advice and direction, if requested.

Students with very high academic standing and a clear research objective may be admitted to a Ph.D.-level interdisciplinary program. This requires the commitment of a faculty member to chair the student's committee. That faculty member will then assist the student in forming a suitable committee of faculty from other departments. The Chair of the Graduate Subcommittee on Urban Studies assists in making these arrangements.

Students interested in Urban Studies should write to the Chair of Graduate Urban Studies in the Office of the Dean of Graduate Studies for further advice and guidance. To receive serious consideration, the prospective student's proposed research should be outlined as fully as possible. A list of relevant courses will be provided on request.

Visual and Performing Arts in Education

Professor and Head: Ronald MacGregor

Ph.D., Ed.D., M.A. and M.Ed. Degrees

The Department offers opportunities for advanced study in the following areas of specialization: Music Education; Art Education.

Music Education

Ph.D., Ed.D., M.A., and M.Ed. programs are offered through the Department. Doctoral studies in Music Education normally require the prerequisite of a magisterial degree in an area of music education. Applicants to M.A. or M.Ed. programs should have a degree in Music Education, and should have acquired some practical experience in music education in a teaching or administrative capacity.

- Ph.D., Ed.D. — to be determined by student and adviser. Research thesis.
- M.A. — 15 credits required; nine credits elective, six credits research thesis.*
- M.Ed. — 15 credits required, 15 credits elective. Major paper required (0 credits).*

Art Education

Ph.D., M.A. and M.Ed. programs are offered through the Department. Doctoral studies in Art Education normally require the prerequisite of a magisterial degree in an area of art education. Applicants to M.A. or M.Ed. programs should have a degree in Art Education or a related field, and should have acquired some practical experience in schools, museums, or other art-related work place settings.

- Ph.D. — to be determined by student and adviser. Research thesis.
- M.A. — 15 credits required; nine credits elective, six credits research thesis.*
- M.Ed. — 15 credits required, 15 credits elective. Major paper required (0 credits).*

* Available full or part-time.

Detailed information on offerings in Music or Art Education is contained in brochures obtainable from the Department. Application forms and other relevant information are available from the same source. For more information contact Visual and Performing Arts in Education, Faculty of Education, 2125 Main Mall, Vancouver, B.C. V6T 1Z4; telephone: (604) 822-4531 (Art Education) (604) 822-5367 (Music Education), fax (604) 822-9366.

Vocational Rehabilitation Counselling

M.A. Degree

(This program has been approved and implementation is expected September 1, 1997 subject to funding.)

An interdisciplinary program is offered leading to the degree of M.A. (Vocational Rehabilitation Counselling). Students may follow either of two options: 1) 56 credits in courses and practical work including a graduating project; 2) 53 credits in courses and practical work, and a 6- to 12-credit thesis. Both programs have been designed to permit full-time students to complete coursework in 16 months. Thesis completion may extend this time period. Part-time studies are also available. The program is broad and covers topics of relevance to the professional vocational rehabilitation counsellor such as vocational assessment of persons with disabilities, job placement, case management, counselling theory, and medical aspects of disability. A full description of the program is available from the Faculty of Graduate Studies.

Opportunities for graduates exist in a variety of settings including worker's compensation agencies, insurance companies, non-profit societies, public sector rehabilitation services, and private practice, including private-for-profit rehabilitation.

The applicant must have an undergraduate degree, preferably with a concentration in related areas such as psychology, occupational therapy, social work, special education human resources management, or nursing and a standing acceptable to the Faculty of Graduate Studies. The applicant will normally be required to have work experience, either paid or volunteer. Letters of reference attesting to the applicant's personal suitability for the field will be required. Prospective students are encouraged to contact the program coordinator to discuss their individual situations.

Westwater Research Centre

Director and Professor: M. C. Healey (Fisheries Centre-Oceanography).

Assistant Director and Professor: A. H. J. Dorsey (Community and Regional Planning).

Assistant Director and Professor: K. J. Hall (Civil Engineering).

Professor: J. Schreier.

Assistant Professors: S. Hinch, T. McDaniels.

The Westwater Research Centre was established during the spring of 1971. The Centre is funded by university support of the core staff and research funds from various

federal and provincial government agencies, private foundations and industry. The function of the Centre is to conduct interdisciplinary research on problems concerning water resources and their associated lands. Its general objective is to provide an improved foundation for decisions about policies and institutional arrangements through rigorous analysis of the alternative courses of action that might be taken. The research program involves natural and social scientists in the analysis of multi-dimensional problems. Students are associated with the Centre by working with a faculty member who is engaged in a Centre project.

Women's Studies and Gender Relations, Centre for Research in

Professor and Director: V. Strong-Boag.

The Centre for Research in Women's Studies and Gender Relations was created in 1991 as part of The University of British Columbia's commitment to ensuring equity in scholarship, research, and teaching. In establishing this Centre, UBC joined such institutions as McGill, York, Quebec, Stanford, Princeton, and UCLA in supporting a multidisciplinary field of new scholarship that promises to have substantial impact on traditional ways of thinking in the humanities, social sciences, sciences, and professional areas.

The Centre has an Advisory Committee drawn from senior scholars who are active in their support of feminist scholarship in a wide range of departments and faculties. The Centre reports to the Dean of the Faculty of Graduate Studies.

The Centre's research and program initiatives are strongly collaborative, both within UBC and with other institutions of higher learning and with the broader community. It has initiated planning for a master's program in women's studies and gender relations. There have also been discussions with feminist scholars at the University of Victoria and Simon Fraser about the creation of a joint doctoral program sometime in the future. In the meantime the Centre seeks to assist students in putting together Interdisciplinary Studies Masters' and Doctoral programs.

The Centre also organizes non-credit graduate student seminars each term and a Graduate Student Presentation Day each spring to highlight feminist research on campus. The Centre hosts Visiting Scholars from a variety of disciplines who actively participate in the activities and programs of the Centre.

Zoology

Professor and Head: J. E. Phillips.

Professors: J. D. Berger, R. W. Blake, J. M. Gosline,

T. A. Grigliatti, P. W. Hochachka, D. G. Holm, D. R. Jones, C. J. Krebs, A. G. Lewis, N. R. Liley, J. D. McPhail, W. K. Milsom, J. Myers, W. E. Neill, D. Patuly, A. M. Perks, T. Pitcher, D. J. Randall, G. G. E. Scudler, A. R. E. Sinclair, J. N. M. Smith, J. D. Steeves, C. J. Walters.

Associate Professors: M. Adamson, H. W. Brock,

T. H. Carefoot, C. E. Gass, H. E. Kasinsky, D. Moerman, D. Schluter, W. Tetzlaff.

Assistant Professors: V. Auld, L. Matsunishi, R. Redfield,

T. Snutch.

Associate Members: M. C. Healey, S. Hinch, W. Jefferies,

T. O'Connor, D. M. S. Webster, T. Zwimpler.

Ph.D. and M.Sc. Degrees

Research work falls into four broad categories with a healthy overlap of interest and interaction among the different groups. In addition, there are several programs of a special or interdisciplinary nature in which the Department of Zoology participates actively with other departments and faculties. Following is a brief summary of the varied investigations and facilities for research.

Cell and Developmental Biology

Several groups of workers in this area, which includes Genetics, are independently investigating problems in a number of different fields of cell biology. The following are the major topics currently under active study: Genetics and cell biology of ciliates; molecular mechanisms of electrical and chemical signalling in the mammalian brain; neural growth patterns; genetic and molecular investigations of muscle development; the role of nuclear proteins in early development; genetics and biochemistry of determination and pattern formation in early development in insects and amphibians; gene organization, packaging, and regulation of expression in *Drosophila*; genetic and biochemical analysis of gene expression during development in *Drosophila*, amphibians and fish; messenger RNA transcription and translation; the genetics of recombination, development, and the meiotic properties of compound autosomes in *Drosophila melanogaster*; molecular evolution in vertebrates; the genetics of aging; regulation of microbial genetic exchange pathways. Equipment includes: fluorescence microscope (Zeiss); UV-microspectrophotometer (Zeiss); UV/visible scanning spectrophotometers; DNA cloning and sequencing apparatus; Amino acid analyzer; ultracentrifuge (Spinco); confocal microscope; electron microscopes (Cambridge Stereoscan, Zeiss EM10B, Zeiss EM10C, STEM, Link x-ray analysis system, Kontron Image Analysis System); ultramicrotomes (Porter-Blum, LKB, Reichert); cryostat; tissue culture and electrophoresis apparatus. Saltwater and freshwater aquaria, and radioisotope handling facilities are available.

Community and Population Biology

This group is investigating the principles of theoretical and applied ecology, and population genetics, as they relate to specific ecological systems. The total program involves field and laboratory experimentation, mathematical modelling, simulation and analysis. Several natural areas are available for field work and the laboratories offer a wide range of facilities for experimentation and observation. New techniques of systems analysis are facilitated through a computing centre containing an analogue and a digital computer, optical and graphical displays, and automated field and laboratory data acquisition systems. A systems mathematician, computer analyst, and programmer assist with the planning of research and analysis of data.

Research programs include: community structure and productivity of a fresh water lake; optimum yield and simulation models of fish populations; genetic variability within mammal, insect, fresh water invertebrate and plant populations; effects of predation on behaviour and genetics of fish populations; experimental studies of speciation and population differentiation; population dynamics of zooplankton, fish, insects, birds and mammals; experimental analysis and mathematical models of predation, competition and dispersal; effects of predation and competition on aquatic invertebrates; conservation of vertebrate populations and communities in disturbed ecosys-

tems; ecology of hummingbirds; a systems approach to human ecology; ecology of large mammals.

Comparative Physiology and Biochemistry

Equipment required for most kinds of sophisticated physiological and biochemical work is available. This includes analogue recording systems, both direct writing and magnetic tape; blood gas equipment including gas chromatographs; pressure and flow metering systems; respirometers for aquatic and terrestrial animals; amino acid and auto-analyzers; atomic absorption and emission spectra photometers; electrofocussing columns; telemetry equipment and all associated peripherals. Special laboratories are provided for neurophysiological research and for experiments involving the use of radioisotopes. Animal holding facilities include controlled environment rooms, several aquarium rooms, and an exterior fish holding facility. Problems currently under active investigation include: comparative studies of circulatory and respiratory dynamics; comparative biochemistry of exercise; biochemistry of hypoxia defense processes; physiology of diving animals; hydrodynamics, kinematics and energetics of swimming; water, salt and energy balance in marine birds; aspects of fish respiration; comparative studies on the control of breathing in birds and reptiles; environmental physiology of marine invertebrates; membrane transport processes, their hormonal control, and physiology of excretion in insects; biomaterials science; enzyme systems in poikilotherms; central nervous control of locomotion in invertebrates and vertebrates; central nervous development; neurohypophysial hormones of different vertebrates and mammalian embryos; comparative studies of plasma kinins, and their importance in mammalian reproduction; endocrinology of the foetus, and hormonal control of foetal membranes; reproductive endocrinology and behaviour of fishes.

Evolutionary Biology

A broad spectrum of research, loosely grouped under this heading, is being pursued by faculty and graduate students in various areas of both vertebrate and invertebrate zoology. Facilities include several excellent museums, a vivarium and aquarium, field equipment including vehicles and rooms for animal culture, experimentation and observation. Problems currently under investigation include: phylogenetic reconstruction and pattern analysis in the evolution of helminth/host systems; morphological and molecular approaches to systematics of parasitic Nematoda; life history tactics in parasitic Nematoda; co-existence and competitive exclusion in aquatic insects; cardiac glycosides in insects and aposematic coloration; studies of functional morphology and evolution of insect structure; zoogeography of insects in British Columbia and the systematics of the Lygaeidae of the world; distribution of marine plankton in relation to physical and chemical oceanography; systematics and zoogeography of fishes, particularly of the North Pacific and Arctic; structural design of animals; significance of natural variation in morphology and behaviour of fishes particularly the guppy *Poecilia* and the stickleback *Gasterosteus*; prey selection in natural predators of the guppy; influence of environmental and hormonal factors on fish behaviour; role of predation on the origin and maintenance of isolation between genotypes (sticklebacks); reproductive biology of salmonid fish and mammals; factors affecting reproductive output in wild populations; regulation of breeding activity in natural populations; evolution within

populations in both continental and island contexts; theoretical and molecular investigations into the evolution of sexual reproduction.

Special Programs

The Department of Zoology is actively involved in several interdisciplinary programs of instruction and research. Further details may be obtained by writing to the Director or Chair of the program as indicated below:

- Cancer Research — The Director, B.C. Cancer Research Centre.
- Oceanography — Head of the Department.
- Fisheries Centre — T. J. Pitcher, Director.
- Wildlife Biology/Biodiversity — C. J. Krebs, A. R. E. Sinclair, Department of Zoology.

Academic Staff

JOHN R. GRACE, B.E.Sc. (W. Ont.), Ph.D. (Cantab), F.C.I.C., M.I.Ch.E., P.Eng., Professor of Chemical Engineering and Dean.
 FRIEDA GRANOT, B.Sc., M.Sc. (Technion, Israel), Ph.D. (Texas), Professor of Management Science and Associate Dean.
 DAVID J. RANDALL, B.Sc., Ph.D. (Southampton), F.R.S.C., Professor of Zoology and Associate Dean.
 LAURENCE RICOU, B.A. (Manit.), M.A., Ph.D., (Tor.), Professor of English and Associate Dean.
 MAURICE STRONG, Honorary Professor.

Graduate Council

The legislative and administrative authority of the Faculty regarding graduate programs of study is vested in the Graduate Council. In all matters concerning admission, scholarships, programs and examinations, the Dean and Associate Deans act, with the Registrar, as administrative officers for the Graduate Council.

Membership of the Graduate Council

Ex-officio Members: The Dean (Chair) and the Associate Deans of the Faculty, the Registrar (Secretary), and the Vice-President (Research).

Elected Members: Up to seventy-five faculty elected by and from members of the Faculty of Graduate Studies; two faculty members of Senate elected by the Faculty of Graduate Studies.

Elected Student Members: Up to fourteen members elected by and from students registered in the Faculty of Graduate Studies; one student member of Senate elected by the students of the Faculty of Graduate Studies.

Membership of the Faculty

Ex-officio Members: The President, the Dean and the Associate Deans of the Faculty of Graduate Studies, the Librarian.

Individuals eligible for full membership in the Faculty must be faculty members holding the title of professor, associate professor or assistant professor or professors emeriti in an academic unit authorized to offer graduate degree programs.

GRE

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Admission

Due to limited resources, the School has been authorized to restrict enrolment. Achievement of the minimum requirements for admission does not guarantee acceptance. See the General Information section on Admission.

Application Deadline

Students applying to enter the School must make formal application to the Registrar's Office no later than April 30 with a documentation deadline of July 15.

B.H.K. Degree Program

The School of Human Kinetics accepts graduates of Secondary School programs with any of the specialities offered.

General Requirements

Students in all years are normally subject to General Academic Regulations in addition to others identified by the School.

English Requirement

Satisfactory completion of the Language Proficiency Index (LPI) examination is prerequisite to all first-year English courses at UBC (see *Calendar* index under Language Proficiency Index).

All B.H.K. students must take 12 credits of English: ENGL 112 and three additional credits of English (first-year level) plus six credits of English (second-year level or higher: ENGL 301 and 302, or 303 recommended).

Part-Time Study

Currently it is extremely difficult to complete a B.H.K. on a part-time basis as there are only a minimum number of courses offered in the evenings and during the Summer Session. Part-time students should discuss their proposed programs with an Advisor. Course prerequisites apply to part-time as well as to full-time students.

Transfer Students

Students who are accepted on transfer from other institutions must normally complete all remaining courses toward their B.H.K. degree at UBC. A maximum of 60 transfer credits will normally be granted. The University will not grant a degree for studies that represent less than the equivalent of two regular Winter Sessions (60 credits).

- 1) In general, transfer credit is limited to the initial two years of a degree program. Credit at a more senior level is possible if prior written permission has been granted by the Senior Faculty Advisor of the School.
- 2) A student wishing to take courses at another institution and transfer the credit toward a B.H.K. degree must first obtain "a letter of permission" from the Undergraduate Advising Centre of the School. It is the student's responsibility to see that an official transcript is forwarded to Admissions, Registrar's Office.

Registration and Program Approval

Students are reminded of the University rule regarding program responsibility. Students are responsible for the completeness and accuracy of registration as it is related to the regulations of the program of study in which they are enrolled.

The following is a summary of the registration procedures for all Human Kinetics students. Complete information may be obtained by contacting the Undergraduate Advising Centre of the School.

- 1) First-Year and transfer students are required to choose a program of study and obtain program approval

The School of Human Kinetics

A School within the Faculty of Education.

Degree programs offered in the School of Human Kinetics are the Doctor of Philosophy, Master of Arts, Master of Science, Master of Human Kinetics, and the Bachelor of Human Kinetics.

Provision can be made for completion of degree studies on a part-time basis or on a combination of full- and part-time study if desired.

before registering through TELEREG. If prior approval is not possible, students may seek program approval immediately after registering.

- 2) Students should choose elective credits appropriate to their selected programs of study.
- 3) Students should make all course changes through TELEREG whenever possible. To gain admission into a "full" Human Kinetics course while TELEREG is open, students must register into the appropriate waiting list section on TELEREG.
- 4) Except in special circumstances, a one-term course may be added or dropped from a student's program within the first two weeks after the beginning of the course and a two-term course within the first three weeks; no record of the dropped course will appear on the student's transcript. A student may also withdraw from the one-term course up to the end of the sixth week and from a two-term course up to the end of the twelfth week. The withdrawal will be recorded on the transcript by a standing of "W" and will not be included in computing averages.
- 5) Students must attend all HKIN classes enrolled in during the first week of each term. Failure to attend these initial classes may lead to a student being removed from the course(s).

Limitation of Enrolment

It may be necessary to limit enrolment in certain courses in the School when the demand for these courses is greater than the resources available. Where limitations in enrolments become necessary, the criteria for implementation will normally be determined by academic considerations approved by the Director and the School. (See also "Space in Courses" in the General Information section of the *Calendar*.)

Prerequisites

It is generally considered that 100-level Human Kinetics courses are prerequisites to 200-level courses and that 200-level courses are prerequisites to 300- and 400-level courses. However, 300- and 400-level courses may be taken in any sequence unless otherwise specified in the course descriptions in the UBC *Calendar*. Students who do not have proper prerequisites for a course can have their registration cancelled automatically.

Electives

Electives are selected to complement the chosen program of study as well as to broaden the student's general education. Many 300/400-level courses require 100/200-level prerequisites, therefore all electives should be se-

lected carefully. **All non-HKIN electives in the Third and Fourth Years must be at the 300-level or higher.** (See Note 3 in "Course of Studies" below.)

Overloading

A student must apply in writing to the Senior Faculty Advisor of the School for permission to register in more than 33 credits of work in a Winter Session or 12 credits of work in a Summer Session.

Graduation Standing

In the B.H.K. program, the categories of degree are: class 1 (80-100%), class 2 (65-79%), and pass (50-64%), calculated on the required work of the Third and Fourth Years.

Supplemental Examinations

Supplemental examinations are not granted for Human Kinetics courses.

Regulations**Withdrawal**

A student who withdraws from the University must seek permission from the Senior Faculty Advisor of the School. (For additional information see Index under "Withdrawal".)

Probation

Probationary status will be assigned to a student:

- 1) who is readmitted to the School after having been required to withdraw; or
- 2) who passes the Winter Session, but fails in more than six credits of work or fails to achieve an overall average of 55% on all courses attempted. The following regulations apply to students on probation:
 - a) deficient program courses must be repeated during the year of probation.
 - b) year status will be that of the majority of the credits being taken.
 - c) program must be approved by an Advisor prior to registration.
 - d) students who do not pass the deficient courses within the probationary academic year will have their academic records reviewed and may be asked to withdraw as regular students from the School until the course deficiencies are completed.

Unsatisfactory Standing

Fail standing in a session will be assigned if a student does not meet one of the following conditions:

- 1) passes in all credits attempted; or,
- 2) if taking more than 12 credits, passes in at least three-fifths of them and obtains an overall average of at least 60% in three-fifths of the credits taken; or,
- 3) if taking 12 or fewer credits, passes in at least one-half of them.

At any level of study, a student who is assigned fail standing will be required to discontinue studies at the University for at least a year. A student who fails at the first- or second-year level will not normally be permitted to re-enrol to repeat that level of work, but if that level is completed successfully elsewhere, consideration will then be given to the student's readmission to the University. A student who fails for a second time, either in repeating a year or in a later year, will be required to withdraw from the University; after a period of at least a year, an appeal to the School of Human Kinetics for permission to re-enrol will be considered.

Bachelor of Human Kinetics — B.H.K. (120 credits)

The Bachelor of Human Kinetics Degree (B.H.K.) prepares students for academic specializations and career opportunities in sport science, leisure studies, health and physical education.

Requirements for the B.H.K. Degree

- ENGL 112 and three additional credits of English (first-year level) plus six credits of English (second-year level or higher) — **12 credits**
- Human Kinetics Core — **12 credits**

The following courses are required:

HKIN 161	3	Introduction to Social Aspects of Leisure and Sport
HKIN 163	3	Biodynamics of Physical Activity
HKIN 164	3	Dynamics of Motor Skill Acquisition

One of:

HKIN 103	3	Conditioning for Sport and Physical Activity
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or:

HKIN 110	3	Analysis of Individual Sport and Dance Performance
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or:

HKIN 200	3	Analysing Performance in Team Sports
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These core courses are normally to be taken in First Year.

- Program Courses (see Courses of Studies) — **87 credits**
- HKIN electives — **9 credits**
- **Total — 120 credits**

Course of Studies

Students may select one of four programs: Exercise Science, Health and Fitness, Leisure and Sport Management, Physical Education.

The following Notes apply to the four programs of study:

- 1) All B.H.K. students must take ENGL 112 and three additional credits of English (first-year level).
- 2) Recommended for the six credits of second-year level or higher English courses: ENGL 301 and 302, or 303.
- 3) A total of 42 to 60 credits of non-HKIN courses is required, including 12 credits of English. A minimum of 12 credits of 300- or 400-level courses must be taken within one specific area of non-Human Kinetics (e.g., Sociology, Biology, Mathematics). See the Undergraduate Advising Centre of the School for a list of appropriate electives.

- 4) The following terms apply to all programs of study:

HKIN Elective — a course of the student's choice from all 300- and 400-level HKIN courses. **One** of the following may also be selected: 252, 261, 280, 281, 292, 293.

Program Required (HKIN) — courses selected from a list of specific HKIN courses designated by a program of study.

Program Elective (HKIN) — HKIN courses that normally complement a program of study and are usually chosen in consultation with the Undergraduate Advising Centre of the School.

- 5) **HKIN 355/455** (Field Experience): information about prerequisites for each HKIN 355/455 section may be obtained at the Undergraduate Advising Centre of the School. Each program of study requiring HKIN 355/455 has a specific section requirement. Students must take the section relevant to their program of study. Prerequisites may not be taken concurrently.
- 6) **Teacher Certification Program:** requirements for the Faculty of Education Teacher Certification programs in Physical Education are given in the Faculty of Education section of the *Calendar*.
- 7) **Adapted Physical Activity:** up to 12 credits in adapted physical activity may be included in the Exercise Science and the Physical Education programs. Nine credits may be included in the Leisure and Sport Management Program. Students in the Health and Fitness program are encouraged to include at least one course in adapted physical activity in their programs.
- 8) Students intending to enter Graduate Studies in Human Kinetics should take HKIN 371 or an approved equivalent.

Exercise Science

For students interested in the biomechanics, movement control, and physiological aspects of human movement.

Year 1

Course	Credits
ENGL (First-Year Level) ¹	6
First Year BIOL, CHEM, MATH, PHYS	12
HKIN 103	3
HKIN 161, 163, 164	9
Total	30

Year 2

Course	Credits
ENGL (200-level or higher) ²	6
First Year BIOL, CHEM, MATH, PHYS	6
Non-HKIN Electives ³	6
HKIN 390, 391	6
Program Electives (HKIN) ⁴	6
Total	30

Year 3

Course	Credits
Non-HKIN Electives ⁵	12
HKIN 363	3
HKIN 370, 371	6
Program Electives (HKIN) ⁶	6
HKIN Elective ⁷	3
Total	30

Year 4

Course	Credits
Non-HKIN Electives ⁵	12
HKIN 463	3
HKIN 468	3
HKIN 499	3
Program Elective (HKIN) ⁶	3
HKIN Elective ⁷	6
Total	30

¹ See Note 1 above, in "Course of Studies".

² See Note 2 above, in "Course of Studies".

³ Program Electives (HKIN): Suggested electives include HKIN 284, 252, 361, 368, 462, 464, 469, and 473.

⁴ See the Undergraduate Advising Centre of the School for a list of appropriate electives.

⁵ These electives must be at the 300-level or higher.

⁶ See Note 4 above, in "Course of Studies".

Health and Fitness

For students who are interested in the broad domain of health and fitness promotion.

Year 1

Course	Credits
ENGL (First-Year Level) ¹	6
Non-HKIN Electives ²	6
BIOL (First-Year Level)	6
HKIN 103, 161, 163, 164	12
Total	30

Year 2

Course	Credits
ENGL (200-level or higher) ²	6
Non-HKIN Electives ³	6
HKIN 252, 261, 284, 292, 390, 391	18
Total	30

Year 3

Course	Credits
Non-HKIN Electives ⁴	9
HKIN 303, 353, 361, 371	12
HKIN Elective ⁵	6
Program Electives (HKIN) ⁶	3
Total	30

Year 4

Course	Credits
Non-HKIN Electives ⁴	3
HKIN 463, 464, 469	9
HKIN 455 (or equivalent) ⁵	15
HKIN Elective ⁶	3
Total	30

¹ See Note 1 above, in "Course of Studies".

² See Note 2 above, in "Course of Studies".

³ See Undergraduate Advising Centre of the School for a list of appropriate electives.

⁴ These electives must be at the 300-level or higher.

⁵ HKIN 455 — students will not be permitted to register in other courses in the same term. Students not admitted into HKIN 455 must complete: HKIN 355 (three credits), two HKIN Program Electives (six credits), one HKIN Elective (three credits), and one non-HKIN Elective (three credits). All courses must be at the 300/400-level.

⁶ See Note 4 above, in "Course of Studies".

Leisure and Sport Management

For students interested in social and managerial aspects of leisure, sport and physical activity.

Year 1

Course	Credits
ENGL (First-Year Level) ¹	6
ECON 100	6
Non-HKIN Electives ²	6
HKIN 103 or 110 or 200	3
HKIN 161, 163, 164	9
Total	30

Year 2

Course	Credits
ENGL (200-level or higher) ²	6
COMM 329	3
Non-HKIN Electives ³	6
HKIN 292, 261	6
HKIN 280, 281	6
HKIN Elective ⁴	3
Total	30

Year 3

Course	Credits
COMM 457, 458	6
Non-HKIN Electives (300-, 400-level) ¹	6
HKIN 372	3
Program Electives (HKIN) ¹	12
HKIN Elective ²	3
Total	30

Year 4

Course	Credits
COMM 465 or 396 ³	3
Non-HKIN Electives (300-, 400-level) ¹	3
Program Electives (HKIN) ¹	6
HKIN 455 (or equivalent) ⁴	15
HKIN Elective ²	3
Total	30

¹ See Note 1 above, in "Course of Studies".

² See Note 2 above, in "Course of Studies".

³ COMM 465 (three credits) is for non-Commerce students. COMM 396 (four credits) is for Commerce students and contains a case study component.

⁴ Program Electives (HKIN): HKIN 293, 340, 360, 367, 382, 383, 392, 456, 481, 489, 492.

Select 12 credits from this list in Third Year and six credits in Fourth Year. HKIN electives may be selected from this list or from all HKIN courses (check prerequisites).

⁵ HKIN 455 - students will not be permitted to register in other courses in the same term. Students not admitted into HKIN 455 must complete: HKIN Program Electives (six credits), non-HKIN Electives (six credits), and one HKIN Elective (three credits). All courses must be at the 300/400-level.

⁶ See the Undergraduate Advising Centre for a list of appropriate electives.

⁷ See Note 4 above, in "Course of Studies".

Physical Education

For students interested in the areas of instruction and coaching effectiveness related to leisure, sport, and exercise programs in both public and private agencies. The Instruction Specialization is essential for those students who wish to pursue careers as instructors or teachers in school or community settings.

Year 1

Course	Credits
ENGL (First-Year Level) ¹	6
Non-HKIN Electives ^{2,3}	6
HKIN 110, 200	6
HKIN 161, 163, 164, 281	12
Total	30

Year 2

Course	Credits
ENGL (200-level or higher) ²	6
Non-HKIN Electives ^{3,4}	6
HKIN 364, 368, 390, 391	12
HKIN 310/320	6
Total	30

Year 3

Course	Credits
Non-HKIN Electives ^{3,4,5}	6
Electives ⁶	3-6
HKIN 361, 369	6
HKIN 310/320	3-6
HKIN 366 or 355 ⁷	3
HKIN 362 or 365 ⁷	3
HKIN Elective ⁸	3
Total	30

Year 4

Course	Credits
Non-HKIN Electives ^{3,4,5}	6
Electives ⁶	12
HKIN 310, 320, or 420	3
HKIN 400 or 355 ⁷	3
HKIN Electives ⁸	6
Total	30

¹ See Note 1 above, in "Course of Studies".

² See Note 2 above, in "Course of Studies".

³ A second concentration in a teaching area is also required by the Faculty of Education.

⁴ Non-HKIN courses at the 300-level or higher.

⁵ See Undergraduate Advising Centre of the School for a list of appropriate electives.

⁶ HKIN or non-HKIN courses may be selected.

⁷ Students shall select one of the following specializations:

a) Instruction: HKIN 362, 366, 400; six credits of HKIN 310, 320, 420. This specialization meets all physical education requirements for the Faculty of Education.

b) Coaching: HKIN 365, HKIN 355 (six credits); 420, 499 (in one sport). This specialization provides a minimum of complete Level II N.C.C.P. certification in one sport and completion of Level III Theory.

⁸ Highly recommended physical education electives for both specializations include: HKIN 252, 280, 355, 363, 370, 371.

Old Program

Bachelor of Human Kinetics - B.H.K. (132 credits)

Students enrolled in the B.H.K. (formerly the B.P.E. program) prior to May 1994 should read the 1993/94 UBC *Calendar* or consult the Undergraduate Advising Centre of the School for the degree requirements.

Graduate Studies

For details of the M.A., M.Sc., M.H.K. and Ph.D. programs in Human Kinetics, see the Faculty of Graduate Studies section of the *Calendar*. For details on graduate work in Education with a Physical Education specialization, see the Education entry in the Faculty of Graduate Studies section.

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Introduction

The Faculty of Law was established in 1945 in temporary accommodation. A permanent structure, opened in 1951, has been incorporated in an enlarged, remodelled George F. Curtis Building which was completed in 1975. It contains a library of approximately 265,000 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, United States and other foreign texts and periodicals, and a substantial collection of International Law materials. The University is also a repository for United Nations publications.

Bachelor of Laws LL.B.

Admission Procedures

Applicants for admission to first year law must submit:

By February 1

- 1) a completed application form. Application forms can be obtained from the Admissions Office of the Faculty of Law. They will be mailed to applicants who cannot pick them up in person but they cannot be faxed or couriered. Applicants are advised to submit their application and supporting documents as early as possible in order to facilitate early selection. A new application form must be submitted each year. Files are kept for one year only. Material submitted will be brought forward in the following year but outdated documents must be replaced by the applicant;
- 2) the appropriate application processing fee (\$40 if transcripts are exclusively from British Columbia post-secondary institutions; \$65 if any, or all, transcripts are from institutions outside British Columbia);

Note: The completed application form, accompanied by the appropriate application fee, must either be received or be postmarked on or before February 1. No exceptions will be made to this requirement.

By March 31

- 3) supporting documents including transcripts;

Note: See information about transcript requirements below. Official transcripts from each institution attended (other than UBC) must be submitted directly to the Faculty of Law by the issuing institutions. Applicants should, therefore, ensure that official transcripts of their academic record are forwarded directly from the issuing institutions as soon as possible.

- 4) a Law School Admission Test (LSAT) score (see below).

Regular applicants are requested not to submit letters of reference.

Incomplete applications cannot be processed, and places will not be held for persons whose applications are on file but whose documents have not been received. It is the responsibility of each applicant to ensure that his or her file is complete by the March 31 deadline.

Since the Faculty of Law receives a very large number of applications each year, personal interviews are not a normal part of the application procedure. The Admissions Adviser is available, however, to answer questions which an applicant may have, by telephone at (604) 822-6303, by letter, or in person. Applicants wishing to discuss questions in person are advised to arrange an interview time to ensure that the Admissions Adviser will be able to meet with them.

The Faculty of Law

The Faculty of Law offers three degrees: Bachelor of Laws (LL.B.), Master of Laws (LL.M.) and Doctor of Laws (Ph.D.). Information concerning the following degrees may be found in the Graduate Studies section of the *Calendar*: LL.M. (Master of Laws) Ph.D. (Doctor of Laws) combined LL.B. (Bachelor of Laws) and M.B.A. (Master of Business Administration).

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. The number of students entering the practice of law in Canada has increased in the last few years and a degree in law is no guarantee of a position in either the necessary year of articles (described below) or in the practice of law.

In the 1995/96 academic year the Faculty of Law and the Faculty of Commerce and Business Administration will not offer the combined program leading to the degrees of Bachelor of Laws and Master of Business Administration. Students currently enrolled in the combined program will be permitted to continue and complete the program.

Applications and all correspondence should be sent to: Admissions Office, Faculty of Law, The University of British Columbia, 1822 East Mall Vancouver, BC, Canada, V6T 1Z1.

Transcripts

If you are not currently enrolled in a college or university, two final official transcripts from each institution attended (other than UBC) must be submitted directly to the Faculty of Law by the issuing institutions. If you are currently attending a college or university (other than UBC), one transcript must be submitted at the time of application. Two final transcripts must also be submitted as soon as they become available after the end of second term if you are accepted. A cumulative record is not sufficient. Separate transcripts must be submitted from each institution attended, even if only one course was taken for transfer to another program. It is not necessary to submit UBC transcripts as they are available to the Faculty of Law, but transcripts for any part of the program taken elsewhere must be submitted to the Admissions Office.

The Law School Admission Test (LSAT)

All applicants for admission (except Joint Committee) must submit a Law School Admission Test. The Data Assembly Services (LSDAS) is not required for admissions purposes. The latest writing of the LSAT that will be accepted is February for entrance the following September. The LSAT is considered valid for 4 years and must be valid at the time of admission, i.e., September. Multiple LSAT scores are averaged. Applications cannot be considered until the LSAT score is received. The Faculty can access LSAT scores directly from Law Services if your LSAT registration is current. The LSAT Information Book (Canadian Service) may be picked up at the Faculty of Law or the Student Counselling and Resources Centre at the University of British Columbia, telephone (604) 822-3811.

It may also be obtained by writing directly to Law Services, Box 2000, Newtown, PA 18940 U.S.A. Although the Faculty of Law cannot mail out the LSAT Information Book, for a small fee the Student Counselling Centre will do so. If you are applying to both American and Canadian law schools, you must use the American registration material which can only be obtained by writing directly to Law Services.

Acknowledgement of Acceptance

Within two weeks of being notified that their application has been accepted, applicants must:

- 1) send a deposit of \$300 by cheque payable to the University of British Columbia, which will be applied to the tuition fees. This deposit is refundable upon receipt by the Faculty of Law of written notification by the applicant of inability to attend, providing such notification is received no later than July 1; and
- 2) submit to the Faculty of Law two recent passport photographs of themselves, endorsed with their names. Photographs should be approximately 1.25" x 1.75", black and white (not coloured) and not the "instant" type.

Note: The deposit of \$300 is payable only by those applicants who receive official notification of their admission to the Faculty of Law and should not be sent in with the initial application for admission.

Admission Requirements

Enrolment in the first year of legal studies at the Faculty of Law is 180 full-time equivalent students. The total LL.B. enrolment (in all years) for 1995/96 will be 600 full-time equivalent students.

Categories for Admission to First Year

Regular Applicants

An applicant must have satisfied by the deadline date for application (February 1) the following minimum academic requirements to be eligible for selection:

- 1) obtained an undergraduate degree in an approved course of studies from an approved university; or
- 2) successfully completed the first three years (minimum 90 credits) or more of an approved course of studies leading to an undergraduate degree at the University of British Columbia or completed the equivalent at an approved university; or
- 3) successfully completed the first two years of an approved course of studies leading to an undergraduate degree at the University of British Columbia, or obtained the equivalent at an approved College or University, and be currently enrolled in the third year of the degree program. An offer of admission will be conditional on:
 - a) successful completion of the third year with a minimum of 90 credits at the University of British Columbia, or the equivalent at an approved university; and
 - b) maintenance of the academic average obtained in the first two years of studies; and
- 4) obtained an overall standing of no less than 65% in the approved course of studies.

Applicants should regard their satisfaction of the entrance requirements as meaning only that they are eligible for selection.

Academic Average and LSAT Score

Because of the competition for admission to the LL.B. program a regular applicant must have an undergraduate academic average substantially higher than the minimum (65%) in order to have a reasonable chance of admission. The median applicant accepted for 1994/95 had an academic average of approximately 79% with an LSAT score of 162 (90th percentile). The academic average and LSAT score are used in a formula to determine an index number by which applicants are ranked. The academic average and LSAT score are weighted approximately equally. In calculating the academic average, only those years of undergraduate study making up the first undergraduate degree that are complete at the time of deadline for application are considered, except for category (3) noted above, where the applicant must maintain the overall standing of the first two years of studies. Generally, no greater weight is attached to one series of academic courses or disciplines than to another. Performance courses are counted towards the required minimum 90 credits but the grades earned in such courses are not counted in computing the academic average. Graduate degrees are not taken into account, except within the discretionary category discussed below.

Applicants who do not have adequate command of the English language will not be admitted. Applicants may be required to take a test to demonstrate adequate facility with the English language.

Regular applicants may request that special circumstances be considered in determining their academic average or LSAT score. The special factors or circumstances (such as medical or other emergency matters) must be documented fully. If a regular applicant requests the Committee to consider making an adjustment to the academic

average (not including certain courses or a year) or to ignore one of two or more LSAT scores, the facts must be verified and supported by appropriate documentation. It is the responsibility of the applicant to submit the appropriate documentation prior to the March 31 deadline. If the special circumstances are medical then a doctor's letter is required. Not all special circumstances can be considered in the regular category. Certain special factors such as financial, learning disabilities or other disadvantages, or ethnic background, can only be considered in the discretionary category.

Regular applicants will be advised in writing as soon as possible whether their application has been accepted or rejected for admission purposes. Applicants who have not received a letter will be on the 'wait' list until a decision can be made. Other categories of applicants, such as discretionary and transfer, usually cannot be advised until the middle of July whether or not their application has been accepted.

Discretionary Applicants

A limited number of positions in first year law are available for discretionary applicants. Because of special factors in life, an applicant may not satisfy one or more of the requirements for regular applicants, but may have other relevant achievements and experience. The Admissions Committee has discretion to respond to this type of situation. It may take account of: (i) physical disabilities; (ii) learning disabilities; (iii) economically deprived backgrounds; (iv) minority or ethnic status; (v) mature status (generally thirty years or older); or (vi) any other factors that the applicant wishes the Admissions Committee to consider. These factors will be considered in the context of the applicant's other achievements and work experience, including volunteer work for community or charitable organizations. Discretionary applicants should generally be residents of British Columbia.

Normal policy is to require discretionary applicants to have completed the first two years of an approved course of studies leading to an undergraduate degree at an approved college or university.

Discretionary applicants must submit a biographical resume detailing the special factors, including their achievements and work experience, that they wish the Admissions Committee to consider. Each application is considered individually on its merits. It is important that applicants send detailed accounts of their circumstances, including their involvement in community or charitable organizations. In this category it is also important that applicants submit documentation (e.g., medical reports, if applicable; letters of reference; etc.) in order for the Admissions Committee to evaluate their files. Application forms must be submitted by the February 1 deadline date. Incomplete applications cannot be evaluated and it is the responsibility of applicants to ensure their applications are complete with biographical resumes, letters of reference, documentation, transcripts and LSAT score by March 31. Discretionary applicants will not be advised whether their applications have been accepted until mid-July.

First Nations Applicants

First Nations Canadians may apply as discretionary applicants in the First Nations category. It is recommended that First Nations applicants contact the Director of First Nations Legal Studies at (604) 822-5559 as early as possible prior to the February 1 deadline to discuss their application. First Nations applicants are required to write the LSAT and they must submit by the February 1 deadline an application form, and by the March 31 deadline a

biographical essay reviewing their academic, work and/or community experience, and provide letters of reference. Applicants are also required to establish their First Nations status. Some First Nations applicants may be required or advised to attend the two month pre-law program for First Nations students offered by the University of Saskatchewan College of Law in the summer months. For further information on this program applicants should write to the Director, Native Law Centre, University of Saskatchewan, Saskatoon, Saskatchewan, S7N 0W0. Satisfactory completion of this program may be a condition of admission for some applicants.

Other Categories for Admission

(Other than to First Year)

Admission in the following four categories is solely within the discretion of the Admissions Committee. Each year there are many requests; however, only a few applicants can be accommodated. Such requests cannot be considered until July when the number of available positions is known. In these four categories application forms should be submitted by May 31 and documentation, e.g. transcripts, LSAT scores, resumes, letters of reference, etc., must be submitted by June 30.

Degree Categories

These two categories require the successful completion of two years of legal studies at the Faculty of Law and result in the applicant receiving a degree from the University of British Columbia.

- 1) *Transfer* – Students at other Canadian common law schools who have completed their first year of legal studies may request to transfer to the Faculty of Law. The Admissions Committee gives preference to applicants who (i) would have been admitted to the first year of legal studies at this Faculty at the time of being admitted to their present institution; (ii) have achieved a satisfactory academic performance in their legal studies at their present institution; and (iii) have compelling reasons for transferring to the University of British Columbia (these reasons usually being compassionate grounds in which the applicant has no control over the circumstances.)
- 2) *Advanced Standing* – Graduates of foreign law schools may request to complete two years of undergraduate legal studies at the Faculty and obtain an LL.B. from the University of British Columbia. Advanced Standing applicants must submit a LSAT score with their academic transcripts. An applicant who, in the opinion of the Admissions Committee, is deficient in English will be refused admission. Applicants may submit a biographical resume detailing any special circumstances they wish the Committee to consider.

Non-Degree Categories

Applicants admitted in either of the following categories are not eligible to receive an LL.B. from the Faculty of Law at the University of British Columbia.

- 1) *Visiting (Letter of Permission)* – Students at other approved law schools may request permission to attend one year of either the second or third year program at the Faculty of Law on a letter of permission basis from their present institution which will grant their LL.B. degree. Criteria for selection are the same as for transfer requests (see above). An applicant from a non-Canadian law school may be required to dem-

onstrate adequate facility with the English language. Visiting status will be granted for a maximum of one year only.

- 2) **Unclassified** – Applicants who have law degrees or their equivalents from foreign jurisdictions and who wish to undertake legal studies at this Faculty in order to satisfy the certification requirements of the Joint Committee on Accreditation may apply for Unclassified status. An LL.B. degree will not be granted on completion of studies. An applicant seeking the LL.B. degree must be admitted as an Advanced Standing student (see above). An applicant requesting Unclassified status is not required to submit an LSAT score. Applicants must have their transcripts evaluated by the Joint Committee on Accreditation, Faculty of Law, Common Law Section, University of Ottawa, 57 Louis Pasteur, Ottawa, Ontario, K1N 6N5. Applicants may be required to satisfy the Admissions Committee of their proficiency in English.

Canadian Civil Law Programs

- 1) Graduates from a civil law program at a Canadian law school may
 - a) apply to the Joint Committee on Accreditation and apply for unclassified status at the Faculty of Law; or
 - b) apply for Advanced Standing (see above).
- 2) Students enrolled in a civil law program at a Canadian law school are not eligible to transfer to the Faculty. However, they may request visiting (letter of permission) status at the Faculty if acceptable to their present institution. Visiting status will be granted for a maximum of one year only.

Appeals

The Admissions Committee will reconsider a decision concerning an application if new information is made available; otherwise decisions are final. An appeal against decisions may be made to the Senate Admissions Committee on the basis of Senate policy (see General Information section of the *Calendar*).

Half-Time Program

Ten students per year are permitted to take the LL.B. degree on a half-time basis. To be eligible for the half-time program students normally must have special needs as a result of such factors as family responsibilities, financial problems or health problems. Half the normal course load of full-time students must be completed each academic year. The first year of legal studies must be completed before a student can take upper year courses. After first year, half-time students may transfer to full-time status provided their academic requirements are met. Similarly, a full-time student in second or third year and in good standing may, for compelling reasons, be permitted by the Admissions Committee to transfer to the half-time program provided the maximum number of half-time students will not be exceeded. Students admitted in the categories of joint committee, advanced standing, transfer or visiting (letter of permission) are ineligible for the half-time program.

Exchange Programs

Students may earn credits towards their LL.B. degree studying abroad in an exchange program. Education Abroad Programs are institution to institution reciprocal agreements approved by Senate. Students selected for such programs remain registered at UBC, pay tuition and students fees only to UBC, and remain eligible for UBC

awards and financial aid. In recent years, UBC law students have participated in exchanges with Hastings College of the Law (San Francisco); University of Melbourne (Australia); University of New South Wales (Sydney, Australia); University of Copenhagen (Denmark); Glasgow University (Scotland); Sophia University (Tokyo); and Université Jean-Moulin-Lyon 3 (Lyon, France). The Faculty also participates in the Group of Ten Student Exchange Program for student exchanges within Canada. The Faculty also encourages participation in the summer Civil Law/Common Law Exchange Program sponsored by the Department of Justice. Credit will be given for LAW 480 (Civil Law) on successful completion of the Program.

Combined LL.B./M.B.A. Program

In the 1995/96 academic year the Faculty of Law and the Faculty of Commerce and Business Administration will not offer the combined program leading to the degrees of Bachelor of Laws and Master of Business Administration. Students currently enrolled in the program will be permitted to continue and complete the program.

Courses of Instruction

The LL.B. program requires a student to acquire a total of 92 credits in three Winter Sessions in the Faculty of Law. First year consists of compulsory courses totalling 32 credits, as described below. The Second and Third Years consist of two Winter Sessions in each of which a minimum of 28 and a maximum of 34 credits shall be taken. Each Session consists of two consecutive terms in each of which a minimum of 12 and a maximum of 18 credits shall be taken.

- **First Year** – all first-year courses are compulsory.
- **Second and Third Years** – all students must take LAW 470 (Evidence), LAW 483 (Moot Court), and either LAW 344 (Constitutional Law), or LAW 345 (Canadian Federalism) and LAW 346 (Canadian Charter of Rights and Freedoms).

Each student must take a sufficient number of programs from the courses and seminars listed to obtain the total number of credits required (92) for the LL.B. degree. Students in the Second and Third Year may not take more than 34 credits (including the non-law option) nor less than 28 credits in any one year. They may not take more than 18 credits or fewer than 12 credits in any one term.

A student may not enrol in a course for which another subject is a "prerequisite" unless the required course was taken and passed earlier. In special circumstances the Dean, in consultation with the Faculty member teaching the subject, may waive this stipulation.

A student must undertake, in either Second or Third Year, at least one independent research project and submit a substantial paper (or series of papers) embodying the results of this research. This obligation usually will be satisfied within the seminar program but students may fulfill this obligation by completing a project, for at least four credits, under LAW 493, 494, 495 or 496 (Directed Research).

Students may, in their Second and Third Years (which may include the Summer Sessions between First Year, Second Year and Third Year), take work in other departments and schools of the University for credit in the Faculty of Law. Such work may be credited for not more than six credits toward the Second or Third Year credit requirements, but shall not reduce the hours or credits in the Winter Sessions below the minimum requirement of 28 credits. Each student must receive advance permission to register in such courses from the Curriculum Commit-

tee, which will base its judgment on its view of the relevance of the proposed course or seminar to the study of law or to a career in law and of the appropriateness of the proposed course or seminar in the light of the student's course of study in the Faculty of Law.

Examinations

Final examinations will be held at the close of each term in December and April except in respect of full year courses which will be examined in April. The examinations may be substituted or supplemented from time to time as may be deemed appropriate.

A student, in order to pass the year, must obtain an average of not less than 55%. The ranking of students in the top 10% of the class will be printed on the transcript.

Term essays and examination papers may be refused a passing mark if they are illegible or deficient in English.

A student who fails the year or withdraws must, before June 30, make application for readmission to the Faculty. All such applications will be dealt with on their own merits.

Where a student has withdrawn in the second term of the Second or Third Year of the program, and is granted readmission into Second or Third Year, credit will be granted towards the requirements of that year for first-term courses completed before withdrawal, provided that: 1) withdrawal was necessitated by a medical or family emergency; and 2) the student achieved a passing mark in each completed course, and an average mark of at least 55% over all completed courses.

Examination results

Results of the session examinations are mailed to students in the graduating classes about the time of Convocation, 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.

Awards and Financial Aid

Through the generosity of the Law Foundation of British Columbia, the Faculty is able to award a number of entrance scholarships and bursaries. Law Foundation Entrance Scholarships are awarded on the basis of academic merit and do not require an application. All applicants who are eligible will be notified by the Admissions Committee. Law Foundation Entrance Bursaries are awarded on the basis of need but also with a view to ensuring that the student population continues to diversify. Thus special consideration will be given to applicants who belong to groups which are underrepresented in the law school and in the legal profession. These bursaries are applied for in September after commencement of the academic year.

General information about financial aid and a list of other entrance awards can be found in the Awards and Financial Aid section of this Handbook. Application must be made to the Office of Awards and Financial Aid by May 15 for loans and bursaries for the academic year commencing in September. An application should be made even if admission to the Faculty has not yet been granted.

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 Profession Act and the regulations of the Law Society of British Columbia. An applicant for admission to

the Bar must comply with the requirements of the Law Society as to academic standing, professional training and ethical standards. These requirements presently include an Admission Program of approximately one year, during which the applicant must serve as an articulated student with a practising member of the Bar and complete a training course and qualifying examinations. Information may be obtained from the Secretary of the Law Society of British Columbia, 845 Cambie Street, Vancouver, B.C., V6B 4Z9.

Applicants who intend to practise law in other jurisdictions must obtain information concerning the requirements for entry to the profession, from the governing body of the legal profession in those jurisdictions.

The UBC 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*. It is a refereed journal, now published twice yearly. Students are responsible for the soliciting and editing of the material, and for the advertising and sales which make the *Law Review* self-sufficient. Members of the Faculty give advice and assistance to the Editorial Board of the *Law Review*, but the chief responsibility is that of the Board.

The Canadian Journal of Family Law

The *Canadian Journal of Family Law* is published at the University of British Columbia, Faculty of Law. It is a refereed publication issued semi-annually. Submissions made to the *Journal* are reviewed by qualified external readers, and the format includes articles, commentaries, and book reviews. In the past the *Journal's* subject matter has included writings on topics such as child welfare, evidentiary issues, child abuse, young offenders and other topics impacting on the family unit.

The *Journal* was started in 1978 and was published under the auspices of the Osgoode Hall Law School in Ontario. In 1982-83 its publication base was moved to the UBC Faculty of Law. It is the only student-run academic journal exclusively dedicated to the study, analysis and articulation of the increasingly important field of family law.

Graduate Studies

For programs offered, see the Graduate Studies section of the *Calendar*.

Academic Staff

Office of the Dean

- C. L. SMITH, Q.C., B.A. (Calg.), LL.B. (Brit. Col.), Professor and Dean.
P. L. BRYDEN, B.A. (Dal.), B.A., B.C.L. (Oxon), LL.M. (Harv.), Associate Professor and Associate Dean.
R. D. DIEBOLT, B.A., LL.B. (Brit. Col.), LL.M. (Lond.), Assistant Professor and Associate Dean.
R. S. REID, C.D., B.A., M.A. (R.M.C.), LL.B. (Brit. Col.), Associate Professor and Assistant Dean of Admissions and Career Placement.

Professors

- J. J. ATRENS, B.A. (Sask., Oxon), M.A., B.C.L. (Oxon).
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J. M. P. WEILER, B.A. (Tor.), LL.B. (Osgoode), LL.M. (Calif., Berkeley).

Associate Professors

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C. F. L. YOUNG, LL.B. (Lond.), LL.M. (Brit. Col.).

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K. MICKELSON, A.B. (Duke), LL.B. (Brit. Col.), LL.M. (Col.).
J. MOSOFF, B.A. (Tor.), M.A. (York), LL.B. (Brit. Col.).
S. SAIZBERG, B.A. (Rochester), M.A. (Brit. Col.), J.D. (Wash.).

Senior Instructor

- D. J. EGGLESTON, B.A., LL.B. (Sask.).

Visitors

- M. D. COPITHORNE, Q.C., B.A., LL.B. (Brit. Col.), Adjunct Professor.
B. D. WOOLLEY, LL.B. (Brit. Col.), Visiting Assistant Professor (part-time).

Adjunct Professors

- B. C. ABRAHAM, B.Sc. Geol., LL.B. (Brit. Col.), Mining Law.
J. R. ALDRIDGE, B.A. (Brock), LL.B. (Osgoode), LL.M. (Brit. Col.), Immigration Law.
H. C. ALVAREZ, B.A. (Brit. Col.), LL.B. (Ont.), International Commercial Disputes.
S. ARNOLD, B.A., LL.B. (Brit. Col.), Labour Law and Policy.
T. BAILEY, B.Sc., LL.B. (Brit. Col.), Industrial and Intellectual Property.
R. BAUMAN, B.A. (W. Ont.), LL.B. (Tor.), Administrative Law.
C. BELISHER, B.A. (S. Fraser), LL.B. (Osgoode), Close Corporations.
D. R. BENNETT, B. Comm., LL.B. (Brit. Col.), Civil Litigation.
M. BENTON, B.A. (Brit. Col.), LL.B. (Osgoode), LL.M. (Dal.), Practical Appellate Advocacy.
C. BEST, B.A., LL.B. (Brit. Col.), Advanced Legal Research.
G. BISARO, B.A.Sc., LL.B. (Brit. Col.), Fisheries Law.
P. BOTZ, LL.B. (Queen's), Topics in International Law and Transactions.
C. BOWDEN, LL.B. (Brit. Col.), Taxation.
F. C. CHAINSON, Q.C., B.A., LL.B. (Brit. Col.), Maritime Law.
K. O'CONNOR COULTER, B.A. (Hons.) (Tor.), LL.B., M.A. (Brit. Col.), Refugee Determination Workshop.
C. COURCHENE, B.A. (W. Ont.), LL.B. (Vic. B.C.), Close Corporations.
D. A. CRUICKSHANK, B.A., LL.B. (W. Ont.), LL.M. (Harv.), Negotiations.

- J. R. CUNNINGHAM, Q.C., LL.B. (Brit. Col.), Maritime Law.
G. DABBS, B. Comm. (Alta.), LL.B. (Brit. Col.), Insolvency.
M. DONNER, LL.B. (Brit. Col.), Corporations.
S. EDGE, B.A. (Duke), LL.B. (W. Ont.), LL.M. (Harv.), Environmental Law.
M. ERIKSSON, LL.B. (Brit. Col.), Topics in Public Law (Environmental Law and Policy).
J. EVANS, B.A., M.A., Ph.D. (Alta.), Proceedings of Crime.
J. B. FESTINGER, B.C.L., LL.B. (McG.), D.E.C. (Vander), Communications Law Seminar.
P. FINLEY, B. Comm., LL.B. (Brit. Col.), Real Estate Development Seminar.
S. D. FRANKEL, Q.C., B.Sc., LL.B. (Brit. Col.), Advanced Criminal Procedure.
R. FREDMAN, B.A. (New College, S. Florida), M.P.A., LL.B. (Queen's), Aboriginal and Treaty Rights.
V. GRAY, B. Mus. (Vic. B.C.), LL.B. (Tor.), Civil Litigation.
B. M. GREEN, B.Sc. (Prince), M.A. (W. Ont.), LL.B. (Osgoode), Industrial & Intellectual Property.
S. GUDMUNDSETH, B.A. (Vic. B.C.), LL.B. (Brit. Col.), Civil Litigation.
J. A. HARDY, B.A. (Car.), LL.B. (Ont.), Insurance.
D. HARRIS, B.A., M.A., M.Phil., D. Phil. (Oxon), LL.B. (Brit. Col.), Civil Litigation.
B. HIGGINS, B.A., LL.B. (Brit. Col.), Law Students' Legal Advice Program.
D. HILL, B.A., LL.B. (Brit. Col.), Law and Information Technology.
A. HILLIARD, B.A. (McG.), B.A. (Law), B.C.L. (Magdalen), LL.B. (Queen's), Real Estate Lease Law.
A. HOBKIRK, B.A., LL.B. (Brit. Col.), B.A. (Oxon), Trial Advocacy.
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J. L. HUNTER, B.C. (Yale), M.Sc. (Lond.), LL.B. (Tor.), Topics in Public Law (Appellate Advocacy).
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D. J. JORDAN, Q.C., B.A., LL.B. (Man.), LL.M. (Brit. Col.), Environmental Law and Policy.
T. KEMSLEY, B.A., LL.B. (Queen's), Administrative Law.
K. KER, B.A. (Hons.) (Car.), LL.B. (Brit. Col.), Trial Advocacy.
M. J. KORENBERG, B.A. (Car.), LL.B. (York), Topics in Corporate and Tax Law.
E. G. KROFT, LL.B. (York), LL.M. (Brit. Col.), Taxation Law.
T. E. LAIBERTE, Q.C., B.A., LL.B. (Brit. Col.), Trial Advocacy.
S. LANYON, B.A., LL.B. (Brit. Col.), Labour Law.
G. A. LETCHER, B.A., LL.B. (Brit. Col.), Topics in Administrative Law.
G. LEVINE, B.A. (Man.), M.A., Ph.D. (Queen's), LL.B. (Tor.), Topics in Public Law.
R. E. LEVINE, B.A. (Hons.), M.A. (Tor.), LL.B. (Brit. Col.), Taxation Law.
L. L. BA., LL.B. (Brit. Col.), Creditors Remedies.
A. LYALL, B.A. (S. Fraser), LL.B. (Windsor), Civil Litigation.
G. MANCELL, B.Sc. (Brit. Col.), LL.B. (Vic. B.C.), Forest Law.
S. MARTIN, B.A. (Hons.) (Cantab.), M.A., LL.B. (Brit. Col.), Media and Communications Law.
J. MATKIN, B.A., LL.B. (Alta.), LL.M. (Harv.), Economic Analysis of Law.
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HIS HONOUR JUDGE H. J. McGVERN, LL.B. (Brit. Col.), Trial Advocacy and Clinical Criminal Law.
P. McGVERN, B. Comm., LL.B. (Brit. Col.), Trial Advocacy.
J. L. McLEAN, B.A. (Queen's), LL.B. (Dal.), Insolvency.
C. D. MUTALA, LL.B. (Man.), LL.M. (New York), Industrial and Intellectual Property.
J. OGLOFF, B.A. (Calg.), M.A. (Sask.), J.D., Ph.D. (Nebraska-Lincoln), Psychology and Litigation.
S. OWEN, LL.B. (Brit. Col.), LL.M. (Lond.), M.B.A. (International Management Institute, Geneva), Topics in Administrative Law.
R. K. PAISLEY, B.Sc. (Brit. Col.), M.Sc. (Wash.), J.D. (Pepperdine), LL.M. (Lond.), Law of the Sea.
M. PALLESON, B. Comm., LL.B. (Brit. Col.), B.C.L. (Oxon), International Law of Natural Resources.
D. W. ROBERTS, Q.C., B.A., LL.B. (Brit. Col.), LL.M. (Harv.), Evidence.
D. ROSENBERG, B.A. (Tor.), LL.B. (Brit. Col.), Advanced Criminal Law.
D. ROSENBLUM, B.A. (Car.), LL.B. (Brit. Col.), Topics in Private Law.
G. R. SCHMITT, Q.C., B.A., LL.B. (Sask.), LL.M. (Harv.), Professional Responsibility.
D. H. SEARLE, Q.C., B.A., LL.B. (Alta.), Topics in Natural Resources.
J. SINGLETON, B.A., LL.B. (Alta.), LL.M. (Lond.), Topics in Commercial Law: Construction.
H. SLADE, LL.B. (Brit. Col.), Aboriginal and Treaty Rights.
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S. SUTHERLAND, Q.C., B. Comm., LL.B. (Brit. Col.), Business Associations I.
J. P. TAYLOR, Q.C., LL.B. (Brit. Col.), Civil Litigation.
F. TOUGAS, LL.B. (Brit. Col.), Topics in International Law and Transactions.
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F. M. TSEHAI, B. Soc., B.L.S. (Paris), B. Ed. (Addis Ababa), Refugee Determination Law.
R. TUNNICLIFFE, B.Sc., LL.B. (Brit. Col.), LL.M. (Col.), International Law.
G. N. TURRIFF, B.A., LL.B. (Brit. Col.), Topics in Procedure and Evidence.

- G. A. URQUHART, B.Sc. Mech. Eng., LL.B. (Manit.),
Topics in Commercial Law (Construction).
- B. VANDERBURGH, B.A. (S. Fraser), LL.B. (Brit.
Col.), Real Estate Development Seminar.
- P. G. VOITH, B.Sc. (McG.), LL.B. (Brit. Col.), LL.M.
(Col.), LL.M. (Cantab), Forest Law.
- J. M. WEBSTER, LL.B. (Brit. Col.), Trial Advocacy.
- J. WHITTOW, B.A., LL.B. (Brit. Col.), Trial Advocacy.
- M. A. WORFOLK, B.A., LL.B. (Brit. Col.), B.C.L.
(Oxon), Trial Advocacy.
- R. E. YOUNG, B.A., M.A., LL.B. (Brit. Col.), Real
Estate Development.
- D. W. YULE, B.A. (Brit. Col.), LL.B. (Queen's), Insurance.
- J. ZISKROUT, B.A., LL.B. (Brit. Col.), Professional
Responsibility and Trial Advocacy.
- D. ZUTTER, B.A., LL.B. (Alta.), Topics in Litigation
and Dispute Resolution Workshop.
- Librarians**
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- T. J. SHORTHOUSE, B.A., B.L.S. (Brit. Col.), Head
Librarian.
- A. H. SOROKA, B.A. (Col.), LL.B. (Virginia), M.L.S. (Col.).

1995-96

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1995-96

Mission and History of the School

The mission of the School is to prepare professionals to exercise leadership in planning, implementing and promoting the preservation, organization and effective use of society's recorded information and ideas. Its graduates work in institutional libraries and archives, for employers in the private sector, and as self-employed intermediaries between stored information and its seekers. While the School cannot guarantee positions to its graduates, it assists them in attempting to find employment suited to their aptitudes and interests.

A school for these purposes was recommended as early as 1921 and actively discussed during the 1940s and 1950s. Instruction began in September 1961 in what was then named the School of Librarianship. Its program in library and information studies has been recognized by the Canadian and American Library Associations continuously since 1962 as fully meeting their standards for the accreditation of graduate education for the library profession.

A separate degree program in archival studies began in 1981; its curriculum accords with the guidelines for archival education published by the Association of Canadian Archivists and the Society of American Archivists. The School's name was changed to its present form in 1984; in 1990, academic governance of both programs was transferred from the Faculty of Arts to the Faculty of Graduate Studies.

Facilities

Location – The School is located on the top floor of the North Wing of the Main Library building.

Library Resources – The University of British Columbia Library is the largest in Western Canada. Its many special collections relevant to the School's interests include contemporary and historical children's books, the University Archives, and many private archival fonds. Many other library and archival institutions and services are available in the metropolitan area for use, as a site for internship/practicum placements, and for observation both informally and on formal arranged visits.

Computer Resources – The School has its own Information Technology Laboratory whose workstations provide access to networked software and local databases on compact disk. All workstations are connected to the Internet, which provides access to remote sources of information, and each student receives a personal e-mail account. Support for word processing is provided in a nearby building using facilities operated by the Faculty of Arts.

Admission

- 1) Address enquiries and applications for admission to the Admissions Committee, School of Library, Archival and Information Studies, 1956 Main Mall, Vancouver, B.C. V6T 1Z1; telephone (604) 822-2404. Specify either the M.A.S. or the M.L.I.S. program. The application fee is \$50 Canadian or \$40 U.S.; simultaneous applications for both programs are charged only one fee. Make cheque payable to UBC – Faculty of Graduate Studies. The deadline for applications is February 1 for the session beginning the following September.
- 2) The School accepts only students whose personal and academic qualifications appear to fit them for successful practice in the library and archival professions. An applicant may be asked to take academic or aptitude tests prior to admission.
- 3) Preference is given to applicants who have been actively engaged within recent years in library or

School of Library, Archival and Information Studies

A School within the Faculty of Arts with Degree Programs offered through the Faculty of Graduate Studies.

The School offers two separate programs, one leading to the Master of Library and Information Studies (M.L.I.S.), the other to the Master of Archival Studies (M.A.S.) degree.

archival work, teaching, academic studies, or some similar intellectual pursuit.

- 4) Each program has a limited enrolment. The number of qualified applicants exceeds the number of available places. In recent years, therefore, those accepted have shown academic ability considerably above the minimum required standard specified below for each program.

Language Requirement

Official results of a TOEFL test are required if the applicant's native language is not English, unless the applicant has a degree from an English-language institution. The minimum TOEFL score required for admission is 600.

Preparation in Undergraduate Studies and Other Areas

The librarian, archivist, or other information professional must often interpret documents, and/or data in searching systems, in more than one language. The study of major languages other than English at the undergraduate level is therefore strongly recommended as preparation for either program. Basic courses in statistics and computer science are also recommended. Efficient use of micro-computers is essential in the information professions today; it is therefore expected that a student comes into either program with some facility in using a computer keyboard and in using MS-DOS or UNIX. Familiarity with either Windows or another graphical operating system is also desirable.

Academic Regulations

The general academic regulations of the University and of the Faculty of Graduate Studies as stated elsewhere in the *Calendar* apply. The following regulations are specific to the School:

- 1) A student may continue in the M.L.I.S. program if an overall average of 70% is obtained in the courses of the Core and if no individual Core course is failed; and if an overall average of 70% is maintained through the rest of the program.

- 2) A student may continue in the M.A.S. program if an overall average of 70% is obtained in the required ARST courses of the first term of the first year, and if no individual course among them is failed; and if an overall average of 70% is maintained through the rest of the program.
- 3) A student must obtain at least 60% in any course to pass that course. However, only six credits graded under 70% can be credited toward the degree.
- 4) If a student fails a required course in either program, it may be repeated if the School so recommends and the Dean approves. The same provision applies to an elective course, but in this case an alternate course may be taken. A course in which a grade of less than 70% was obtained may be repeated for a higher standing if recommended by the School.
- 5) Field trips are integral parts of both programs; satisfactory participation in them is required of all students.
- 6) A term essay or examination paper may be refused a passing mark if it is, in the opinion of faculty, deficient in English.
- 7) The School reserves the right to require a student to withdraw from the M.A.S. or M.L.I.S. program if considered to be unsuited to proceed with the study or practice of the library or archival profession.

Methods of Instruction

The School employs a wide variety of instructional methods including lectures, laboratories, discussions, seminars, directed study, colloquia, field trips, and field work. Each student has an individual faculty adviser available for consultation and specific assistance.

Field Trips

Field trips are arranged within the Session. For the most part these are visits of observation of a few hours in libraries or archives in the Vancouver area, but day-long or even two-day trips may be required. The student is responsible for most expenses incurred in conjunction with such field trips and with off-campus activities in the practicum/internship/professional experience courses.

Attendance

Regular attendance is expected. A student who cannot attend a class, field trip, etc., should notify the School Office or the instructor concerned by telephone or e-mail, preferably in advance if the absence is foreseen.

Part-Time Work

The academic work of the School's courses is considered very time-consuming; outside work during at least the first term in either program is discouraged. The Faculty of Graduate Studies stipulates that full-time students may not commit more than 12 hours per week, on the average, of working time to matters other than the degree program. Enquiries for part-time work at the University should be directed to Student Placement Services, Brock Hall.

Awards and Financial Assistance

University Graduate Fellowships are awarded by a committee of the Faculty of Graduate Studies on the basis of academic excellence. They are open to any graduate student regardless of citizenship or visa status. Nominations are made by the Director of the School, who automatically considers all applications for entry into either program which have been received by December 1 of the previous year. Separate application by the student is therefore not necessary although forms for the purpose are available. Information on bursaries and loans is available from the Awards and Financial Aid office. Independently of the above, the School administers a small number of awards, most of them available only to students who have already completed part of a program.

Admission to Courses

A student not registered in one of the School's programs who wishes to enrol in or audit any of its courses should apply to the Director.

Master of Library and Information Studies M.L.I.S.

The Nature of the Library and Information Professions

Libraries today are a basic resource for formal education at all levels, the chief means of self-education, indispensable for scholarship and research, a rewarding recreational facility, and a major channel for the dissemination of information. The role of librarians is to translate the library's potential into effective, efficient service by making available a wide range of materials in all media, by organizing and describing these materials so as to facilitate their use, by stimulating the use of such materials, and by assisting and participating in the many-sided pursuit of information.

Graduates are expected to understand and appreciate the application of computer technology to information management, the ways in which information is communicated to a variety of user groups, and policies which affect the free flow of information. There are therefore many opportunities for them to work outside, as well as within, the institutional library setting. Planning and developing bibliographic and non-bibliographic databases and searching systems, designing and operating information networks, and providing information search services on a free-lance basis are characteristic of the less traditional professional functions.

Undergraduate Preparation

A broad cultural background is expected of the librarian. In the first and second undergraduate years, select elec-

tive courses which will give some acquaintance with the humanities, sciences, and social sciences. In the third and fourth years, seek to gain special competence in at least one field of knowledge related insofar as can be foreseen to special areas of career interest. For example, if contemplating a career in public libraries, take courses in government, public administration, and the like. In general, it is desirable to have a wide range of reading and recreational interests.

Admission

For admission to the M.L.I.S. program, a candidate must:

- 1) possess a bachelor's degree from a recognized university in a discipline acceptable to the Admissions Committee for the program;
- 2) have achieved at least upper-second-class standing in the course work at the third- and fourth-year level, including first-class standing in at least 12 credits of this work;
- 3) show promise of superior professional performance as attested by letters of reference and a personal written statement.

A candidate who already has a formal qualification as a professional librarian (for example, a B.L.S. degree from a program which was at the time accredited by the American Library Association) and who wishes to enrol in the M.L.I.S. program is considered on the same basis as above. It is expected that letters of reference will demonstrate a history of successful professional practice and career development. A candidate who has recently successfully completed part of a graduate program accredited by the A.L.A. at another School will also be considered for admission to complete the program at this School.

An applicant possessing a Bachelor's degree or its academic equivalent, who does not meet the requirements of 2) above but has had sufficient formal training or relevant professional experience to offset such deficiencies, may be granted full or provisional admission on the recommendation of the Director of the School and the approval of the Dean of the Faculty of Graduate Studies. An applicant possessing a Bachelor's degree or its academic equivalent, who does not meet the requirements of 2) or of the previous sentence, may be permitted to register as a Qualifying student for no more than one year on the recommendation of the Director of the School and the approval of the Dean of the Faculty of Graduate Studies. Satisfactory completion of a Qualifying year neither guarantees subsequent admission to the M.L.I.S. program nor substitutes for any of its courses.

Requirements for the Degree

A student must normally complete at least 48 credits of work approved by the School plus required non-credit studies such as a practicum.

A student must begin the program by taking four courses (LJBR 500, 510, 540, and 560) in Term 1 of a Winter Session. These introduce the knowledge that should be common to all librarians and are collectively known as the Core. The examinations at the conclusion of the Core courses constitute a comprehensive examination, and no other course may be begun for credit toward the degree until these courses and examinations have been successfully completed.

LJBR 511, 541, 570, and 590 and a non-credit practicum (LJBR 595) are also required for graduation. The remainder of the program consists of either 24 credits of additional courses, including LJBR 598, or 12 credits of course work and LJBR 599 (a 12-credit thesis). The student consults with a faculty adviser in deciding which options

to pursue and to ensure a balanced program and optimal sequencing.

Credit for courses other than those designated LJBR at this University may be applied to the program, whether taken at this or another institution; they may, however, total no more than six of the required 48 credits. Permission to apply such a course for credit must be obtained from the student's adviser before the student begins the course. Any such course must be at the 300-level or above (or the equivalent at another institution) and granting of permission will be based on the course's direct relevance to the individual's work in the M.L.I.S. program.

No more than 12 credits of course work may be taken during any one term of a Winter Session or during a Summer Session without permission from the School's Director. Any course work after the first term (the Core) may be taken on a part-time basis. All degree requirements must be met within five years of initial registration but with the permission of the Dean of the Faculty of Graduate Studies a student may take leave of absence from the program for an agreed period which is not counted in the five-year maximum.

A student who enters the program having previously begun work toward, or obtained, a recognized qualification in professional librarianship as specified under "Admission" above may be exempted from some or all of the required courses and need not begin in a September. After beginning the M.L.I.S. program, such a student may apply for reduction in the total credit requirement, but at least 30 credits must be completed in the program, of which no more than three may be for courses other than those designated LJBR. Such a student must be in full-time residence for at least one Winter-Session term unless the prior qualification was a B.L.S. from this University, in which case all work may be done part-time. For such students, all degree requirements must be met within four years of initial registration.

Practicum and Professional Experience

The required non-credit LJBR 595: Practicum provides directed experience under actual library operating conditions. It normally takes place following successful completion of the courses of the first Winter Session and is arranged by the School after consultation with the student. The decision to elect LJBR 596: Professional Experience must be confirmed with the faculty adviser by the middle of the term preceding the one in which the student will register for this course so that a project, supervisor, and placement may be arranged.

Thesis

A student with research interests should elect to write a thesis. Consultation on this with the faculty adviser should begin by the end of the term in which 24 credits have been completed.

Courses Taken in Other Library Schools

A student who has completed part of this M.L.I.S. program and subsequently takes courses in an accredited program in the field at another institution may apply to have some credit for those courses applied to this degree provided such courses can be equated with those in this program which the student has not already taken. Address application for such transfer of credit to the Director.

Master of Archival Studies M.A.S.

The Nature of the Archival Profession

Archives preserve the records created by public and private bodies in the normal course of their activities and make those records available for a broad range of societal purposes including scholarly research. As such, archives are an important agency of many modern administrations (governments, businesses, churches, universities, etc.) and are vital institutions in the preservation of society's documentary heritage. The role of the archivist is to plan and implement programs to appraise, acquire, preserve, and make available records of enduring value to society.

The archivist's work involves promoting and administering the systematic management of records throughout their life cycle, acquiring a broad range of materials of all media, and applying automation to problems of retrieving information from archives - all within a legal and regulatory context. Thus, while maintaining close links with the study of history, professional archival studies also have interdisciplinary links with administrative studies, legal studies, media and communication studies, and library and information studies.

Undergraduate Preparation

An undergraduate student considering working in the field of archives should consult the School about useful preparatory courses. An interview may be arranged at any time.

A broad cultural background is expected of the working archivist. The prospective student should therefore endeavour to become acquainted with the humanities, social sciences, and sciences during undergraduate studies. Because of the close link between archives and historical studies of all kinds, particular attention should be paid to studies in history and allied disciplines which take an historical perspective such as anthropology, economics, geography, and sociology. The study of Canadian history is extremely useful preparation for a number of the required courses of the program; successful completion of at least 12 credits in Canadian history at the undergraduate level is desirable.

Admission

For admission to the M.A.S. program, a candidate must:

- 1) possess a bachelor's degree from a recognized university in a relevant discipline or in an area which is regarded as appropriate by the Admissions Committee for the program;
- 2) have achieved at least upper-second-class standing in the course work at the third- and fourth-year level, including first-class standing in at least 12 credits of this work;
- 3) show promise of superior professional performance as attested by letters of reference and a personal written statement.

An applicant possessing a Bachelor's degree or its academic equivalent, who does not meet the requirements of 2) above but has had sufficient formal training or relevant professional experience to offset such deficiencies, may be granted full or provisional admission on the recommendation of the Director of the School and the approval of the Dean of the Faculty of Graduate Studies. An applicant possessing a Bachelor's degree or its academic equivalent, who does not meet the requirements of 2) or of the previous sentence, may be permitted to register as a Qualifying student for no more than one year

on the recommendation of the Director of the School and the approval of the Dean of the Faculty of Graduate Studies. Satisfactory completion of a Qualifying year neither guarantees subsequent admission to the M.A.S. program nor substitutes for any of its courses.

Requirements for the Degree

The master's degree is awarded on the completion of 48 credits of work. Studies must begin in Term 1 of a Winter Session; Core courses comprising 24 credits (ARST 510, 515, 516, 520, 530, 551, 573, and 590) must be completed in the first Winter Session in full-time attendance. The remainder of the program consists of either 24 credits of additional courses (including ARST 598) plus a comprehensive examination, or 12 credits of course work and ARST 599 (a 12-credit thesis). The student consults with a faculty adviser in deciding which options to pursue and to ensure a balanced program and proper sequencing.

Credit for courses other than those designated ARST at this University may be applied to the program, whether taken at this or another institution; they may, however, total no more than six of the required 48 credits. Permission to apply such a course for credit must be obtained from the student's adviser before the student begins the course. Any such course must be at the 300-level or above (or the equivalent at another institution) and granting of permission will be based on the course's direct relevance to the individual's work in the M.A.S. program.

No more than 12 credits of course work may be taken during any one term of a Winter Session or during a Summer Session without permission from the School's Director. Any course work after the first Winter Session may be taken on a part-time basis. All degree requirements must be met within five years of initial registration but with the permission of the Dean of the Faculty of Graduate Studies a student may take leave of absence from the program for an agreed period which is not counted in the five-year maximum.

Internship

Some extended field experience in an archival repository is highly desirable for a student who has had limited prior contact with the work of the practising archivist. It is usual to undertake this during the summer between the two years of course work. The decision to elect ARST 595: Internship must be confirmed with the faculty adviser by the end of the second week of classes in the second term of studies so that arrangements may be made.

Thesis

A student with research interests should elect to write a thesis. Consultation on this with the faculty adviser should begin by the end of the term in which 24 credits have been completed.

Academic Staff

Director and Professor

KEN HAYCOCK, B.A., Dip.Ed. (W Ont.), M.Ed. (Ont.), A.M.L.S. (Mich.), Ed.D. (Brigham Young), F.C.C.T.

Professors

RONALD HAGLER, B.A. (Ont.), A.M.L.S., A.M., Ph.D. (Mich.).
PETER A. SIMMONS, B.A. (San Francisco State College), M.S. (Pratt Institute, N.Y.), Chair of the Library and Information Studies Program and Coordinator of Academic Computing

Associate Professors

CHARLES DOLLAR, B.A. (Union), B.D. (Southern Theological Seminary), M.A., Ph.D. (Kentucky).
LUCIANA DURANTI, Dott. Lett., Dipl. (Rome).
TERENCE M. EASTWOOD, B.A., M.A. (Alta.), Dip.Ed. (Vic. B.C.), Chair of the Archival Studies Program.
JUDITH M. SALTMAN, B.A., B.L.S. (Brit. Col.), M.A. (Simmons).

Assistant Professors

ANN CURRY, B.A., B.L.S. (Alta.), M.L.S. (Brit. Col.), Ph.D. (Sheffield).
RICHARD L. HOPKINS, B.Ed., B.L.S., M.L.S., M.A. (Brit. Col.), Ph.D. (Tor.).
LYNNE LIGHTHALL, B.A. (Queen's), M.L.S. (Brit. Col.).

Senior Instructors

SYLVIA CROOKS, B.A., M.L.S. (Brit. Col.), Coordinator of Admissions and Placement.
MARY SUE STEPHENSON, B.A. (Texas), M.L.S., Ph.D. (North Texas), Coordinator of Research Services.

Professional in Residence

ALEXANDRA BRADLEY, B.Ed. (Brit. Col.), B.L.S. (Alta.).

Lecturer from Other Department

WENDY SUTTON, B.A. (Brit. Col.), M.A. (Calif., Berkeley), Ph.D. (Michigan State), Assistant Professor of Language Education.

Coordinator of Continuing Education

ISABEL PITFIELD, B.A. (Queen's), B.L.S. (Tor.).

Sessional Lecturers

SUZANNE DODSON, B.A., B.L.S. (Brit. Col.).
SRIANI FERNANDO, B.A. (Ceylon), M.L.S. (Brit. Col.).
GLENDA GUTTMAN, B.A., M.L.S. (Brit. Col.).
MARIANNE HALL, B.A., M.L.S. (Brit. Col.).
HEATHER McNEIL, B.A. (Guelph), M.A. (S.Fraser), M.A.S. (Brit. Col.).
LAURA MILLAR, B.A., M.A.S. (Brit. Col.).
WILLIAM MITCHELL, B.A. (Alta.), M.Arch. (Tech. Univ. Nova Scotia), M.L.S. (Dal.).
LINDA MORRISON, B.A. (Bishop's), Dip.Ed. (McG.), M.L.S. (Brit. Col.).
ANN TURNER, B.Mus., M.B.A. (Brit. Col.), M.Lib. (Wash.), A.R.C.T. (Tor.), C.G.A.

1995-96

Doctor of Medicine — M.D.

Curriculum

The medical course extends through four academic sessions. The academic session in first year is of 35 weeks duration, including three weeks of examinations, a study week and one week of vacation. The first term is 16 weeks in length, comprising 15 instructional weeks and one week of examinations at term end. The second term is divided into two phases. Phase I is 13 weeks in length, comprising 10 instructional weeks, a study week, an examination week and one week's vacation. Phase II is seven weeks in length, comprising six instructional weeks and one week of final examinations. The second year is of 37 weeks duration, consisting of 32 instructional weeks, with one week of examination prior to Christmas break preceded by one week of study time and an end-of-course examination week, and an end-of-term examination week preceded by one week of study time. The third year is of 33 weeks duration including one week of examinations prior to Christmas break, a four-week elective block and one week of examinations at year end. The final year is of 49 weeks duration. In addition, there are holidays over Christmas and New Year.

In first year, the student is given a broad understanding of the scientific basis of modern medicine through correlated courses in anatomy, biochemistry and physiology. From the beginning, students are also introduced to patient care through Family Practice 401 and a Clinical Skills course. An awareness of the social and clinical issues in medicine is fostered, as is the history of the health sciences. Anatomy, biochemistry and physiology conclude at the end of the first phase; general pathology and medical microbiology start in phase two in a transition from normal to abnormal physiology. In second year, pharmacology is given with pathology, medical microbiology and introductory courses in psychiatry and medical genetics. A correlated course in neurological sciences is also presented during this year. This enables an integrated system approach to clinical medicine to be started at the beginning of second year and to continue through the remainder of the curriculum. In the third year, the essentials of modern diagnosis and treatment are presented by the clinical departments in a series of lectures, demonstrations and seminars, integrated by systems and illustrated by bedside clinics given in the affiliated teaching hospitals. Instruction in history-taking and physical examination is given during ward work sessions. To enable the student to return to areas of interest in the basic sciences aroused by clinical work or to meet future needs in practice or research, electives in the basic sciences and clinical departments are required in the second term of third year. Fourth year is a clinical clerkship, and offers the senior medical student a wide range of opportunities for applying knowledge of clinical medicine under supervision in the teaching hospitals by means of rotations within the clinical departments. As part of the clerkship year, an elective period of six weeks is offered which affords the student a wide opportunity of choices in the clinical departments of the teaching hospitals or in the community hospitals of B.C. Should students so desire, they may present their own elective programs to the Faculty for approval. At the commencement of fourth year, a one week interdepartmental course is offered covering topics such as medical ethics, medical jurisprudence, stress, and practical clinical skills.

During the program sufficient time for independent study has been set aside to allow and encourage students to

The Faculty of Medicine

At the undergraduate level, the degrees of Doctor of Medicine (M.D.) and Bachelor of Medical Laboratory Science (B.M.L.Sc.) are offered directly by the Faculty of Medicine. At the postgraduate level, the Faculty offers Postgraduate (Residency) Training programs.

Together with the Faculty of Science and the Faculty of Graduate Studies, the Faculty of Medicine offers combined programs leading to the degrees of Doctor of Medicine (M.D.) and Bachelor of Science (B.Sc.), and Doctor of Medicine (M.D.) and Doctor of Philosophy (Ph.D.).

The School of Rehabilitation Sciences is a component of the Faculty of Medicine which offers training in physical and occupational therapy. The School of Audiology and Speech Sciences is also a part of the Faculty and provides instruction in speech pathology. Information concerning the Schools may be found elsewhere in the *Calendar* and enquiries should be sent to the Directors of the Schools.

take responsibility for their own progress in meeting the broad objectives of the undergraduate medical course.

The first year of the course is given mainly on the campus but starting in the second year instruction is transferred to the affiliated teaching hospitals (Vancouver Hospital and Health Sciences Centre, Oak Street and UBC Sites; St. Paul's Hospital; B.C. Women's Hospital and Health Sciences Centre; Children's Hospital; B.C. Cancer Agency). In addition, the facilities of the Lions Gate Hospital, Royal Columbian Hospital, the Provincial Mental Hospital, G. F. Strong Rehabilitation Centre, Canadian Arthritis and Rheumatism Society Centre are used for various aspects of clinical teaching, as well as other community resources, including B.C. community hospitals.

Selection of a Program of Premedical Studies

Students planning to apply for admission to the Faculty of Medicine should select their courses of study, in addition to the specific prerequisite courses listed below, to conform with the requirements of a baccalaureate degree program of their choice. It is considered desirable that students admitted to Medicine should come from a variety of premedical academic backgrounds, **and there is no particular degree program that is looked on as having unique merits as preparation for the subsequent study and practice of medicine.**

In certain circumstances it may be in order for academically strong candidates who have completed programs of study that have not included all of the medical school prerequisites to take an extra year of studies in order to complete the entrance requirements.

Students who have completed programs that have included all of the prerequisites and who then enrol in "unclassified" non-degree programs for the sole purpose of improving their academic qualifications for admission to the Faculty of Medicine are advised that only a small proportion of candidates in these circumstances ultimately gain admission, and that a high level of academic performance in such an "unclassified" year will not necessarily result in acceptance into the Faculty of Medicine.

Admission

Candidates for admission to the Faculty of Medicine must have completed, as a minimum, three full years in the Faculty of Science or the Faculty of Arts or other faculty at The University of British Columbia (90 academic credits), or the equivalent thereof.

Applications from individuals already holding an M.D. degree or its equivalent will not normally be considered.

All applicants must have completed the following University level prerequisite courses by May of the year in which they are applying for admission to Medicine. (Note: Advance credit will not be granted for Grade 13 courses.)

- 1) Six credits of English chosen from ENGL 110 (Approaches to Literature), ENGL 111 (Approaches to Non-fictional Prose), ENGL 112 (Strategies for University Writing), ENGL 120 (Literature and Criticism) and ENGL 121 (Introduction to Literary Theory). ENGL 112 is recommended.
- 2) BIOL 120 (Genetics, Evolution and Ecology) **or** 110 (Cellular and Organismal Biology) **or** 115 (Organismal Biology) **and** 120 or equivalent.
- 3) CHEM 110 **or** 121 and 122 (Principles of Chemistry) **or** 103 (General Chemistry) or equivalent.
- 4) CHEM 203 **or** 213 **or** 230 (Organic Chemistry) or equivalent.
- 5) BIOC 300 **or** 303 or equivalent **or** BIOL 201 and BIOC 302.

The foregoing prerequisite courses are required of students taking premedical programs at The University of British Columbia. Students taking premedical studies at other universities must submit evidence of having successfully completed equivalent courses in these subjects. It is also strongly recommended that students take courses in behavioral sciences, biometrics and statistics, and physics.

The Medical College Admission Test (MCAT)

All candidates are required to take the Medical College Admission Test and perform satisfactorily in the test. Applicants must have completed this examination by the Fall of the year prior to the year that they apply for

entrance to Medical School. The April MCAT will not be accepted in the year for which application is being made for entrance. The design of this test underwent a change in the spring of 1991 and all candidates for admission to Medicine are required to take the MCAT in its new (post-1991) format. The MCAT test result is normally valid for a period of five years.

Arrangements to take the Medical College Admission Test should be made with the counselling service of the institution at which the student is taking premedical studies. Information regarding the test may be obtained from the MCAT Program Office, P.O. Box 4056, Iowa City, Iowa 52243, U.S.A., telephone: (319) 337-1357, or from the Student Counselling and Resources Centre at The University of British Columbia.

Required Academic Standards

The minimum acceptable academic standing for admission to the Faculty of Medicine is an overall average of 70% (or the equivalent in other grading systems) based on grades received in all university-level courses completed to the time of application. Achievement of this minimum academic requirement, however, provides no assurance of admission. The number of applicants so qualified exceeds by a wide margin the number of places in the entering class and the scholastic standards of those admitted to the Faculty of Medicine in recent years have been considerably above this minimum required grade.

Note: Persons who have been required to withdraw from another medical school for academic reasons are not eligible to apply.

Selection of Candidates for Admission

The first year entering class is presently limited to 120 full-time students. As noted above, the number of qualified applicants greatly exceeds this limit.

In the selection of the candidates to be granted admission the following guidelines are observed:

- 1) No discrimination is made with respect to age, gender, race, religion, marital status, or economic status of the applicant.
- 2) Preference is given to well-qualified residents of the Province of British Columbia.
- 3) Selection of candidates for admission is made by a consensus of the Admissions Committee arrived at after independent rating of the applicants by individual members of the Committee. The rating assigned an applicant is based on the following criteria:
 - a) The candidate's total academic record since secondary school graduation. Apart from fulfilling the prerequisites referred to above it is the *total* performance in the student's academic program rather than the specific field of study that is taken into account by the Admissions Committee. Considerable weight is placed on the candidate's overall average in all university courses completed to date, and on the average in the specific prerequisite courses listed above. Consideration is also given to performance in courses at senior undergraduate and graduate level, and to trends in grades from year to year.
 - b) Scores on the Medical College Admission Test.
 - c) Evaluation by at least three referees selected by the candidate and submitted under confidential cover.
 - d) Evaluation by individual members of the Admissions Committee of non-academic autobiographi-

cal material supplied by the applicant in the application documents.

- e) Evaluations based on interviews which may be held at the discretion of the Admissions Committee.
- 4) Non-academic qualities to which special attention is paid include the following: motivation, maturity, integrity, emotional stability, realistic self-appraisal, social concern and responsibility, reliability, creativity, scientific and intellectual curiosity, attitude toward continuing learning, problem solving and decision-making aptitude, ability to communicate verbally and in writing, leadership potential, capacity to understand and cooperate with others, concern for human welfare, and demonstrated high level of performance in any aspect of human endeavour.

Application Procedure

Application forms will be available from the Dean of Medicine's office from August 15 to December 15. Completed applications should be returned to the Dean's office as early as possible and in any case must be received no later than December 15, the deadline for receipt of applications. Applications without transcripts will meet the December 15 deadline but cannot be processed until all documents have been received. Applicants should therefore ensure that all official transcripts, MCAT scores and letters of reference are submitted as early as possible to the Dean's Office, Faculty of Medicine.

Personal interviews with members of the Admissions Committee may be required of any applicant.

All applicants to the M.D. degree program are required to pay a \$50 application fee. In addition, University regulations require that a fee of \$25 be charged for evaluating and processing educational records issued by institutions outside the Province of British Columbia. These fees must accompany the application for admission form when submitted with supporting documents. These fees are non-refundable and are not applicable to tuition.

Notification to successful applicants will generally be issued by early July or in some instances by an earlier date.

An applicant who is successful must submit a deposit of \$100 within four weeks of notification of the offer from this university. This deposit is non-refundable and shall be applied toward the tuition charge for the first term of the session for which the candidate has been accepted.

A successful applicant is required to submit a health record to the Student University Health Service at the time of acceptance. The approved form will be included in the registration package. Any false or inaccurate statement concerning the applicant's health could jeopardize his or her status as a student.

An applicant with any condition requiring periodic medical attention or interfering with normal activities must submit a medical certificate with the application. In this certificate the examining physician should describe the extent of the disability and estimate its effect on the applicant's future ability to practice medicine.

Reapplications

Qualified candidates who are not admitted following initial application may reapply for admission in a subsequent year without prejudice. However, re-applications from candidates who have already applied unsuccessfully for admission to this faculty on three previous occasions are not normally accepted. Applications which are withdrawn in writing prior to adjudication are included in this limitation when more than two applications have been withdrawn.

Admission of Students by Transfer

The acceptance of transfer students will depend upon the existence of vacancies in the class year for which they are applying.

The student will only be considered if attending a medical school in Canada or in the United States that is accredited by the Committee on Accreditation of Canadian Medical Schools and the Liaison Committee on Medical Education.

Factors taken into account in the transfer request include the reasons for transfer, the academic standing of the student and a letter from the Dean (or designate) of the medical school from which the applicant wishes to transfer. Interviews may be required.

Students applying for transfer must complete the Application for Admission form, and are subject to the same application fees (see above). In addition, students accepted for transfer will be responsible for any additional costs related to processing their transfer. Students applying for transfer into Second Year must submit their applications by April 30 of each year, and will be informed of the decision regarding their application by mid-August. Applications for transfer into Third Year will not normally be considered due to the structure of the program.

Applications for visiting students in the Fourth Year must be submitted by January 31 of each year and students will require the approval of their medical school in order to apply. Students will be informed of the decision relating to their application by late April. Those individuals who successfully complete the requirements of Fourth Year to the satisfaction of both The University of British Columbia and their home university will have their degree conferred by the latter.

A student must be in good standing in an accredited medical school to request a transfer.

Transfer of Students from Graduate Studies

Students enrolled in the Faculty of Graduate Studies are advised that only a small proportion of such students ultimately gain admission to the Faculty of Medicine. For this reason, students are discouraged from pursuing this course of action to gain admission to the Faculty of Medicine with advanced standing. Acceptance of such students into the Faculty of Medicine will be made through the existing selection procedures of the Faculty of Medicine as outlined above.

Deferred Entry

Under some limited, special circumstances, admission may be deferred for one year at the discretion of the Admissions Selection Committee. Requests for deferred entry must be stated on the application form. Students who have not completed a first degree are not eligible for deferred entry.

Registration

The academic year of the Faculty of Medicine normally begins late in August for first, second and third years. The academic term for fourth year begins early in May.

Students in each year of the medical program will be notified of registration procedures.

No student will be allowed to register after the first day of instruction in the term, nor will be admitted to any class after its first session, except by permission of the Dean.

Student Expenses

Instruments and supplies will be required throughout the four year program. It is recommended that no purchases

be made until details concerning the necessary equipment are furnished at the beginning of classes by the departments concerned. In first year, students should allow approximately \$3,500 to cover the costs of the above. In subsequent years of the program costs will vary.

Textbooks

Information regarding textbooks will be given at the first class period in each course. Not less than \$500 per year should be available for purchasing textbooks and expendable supplies.

Courses Leading to the M.D. Degree

Departmental and interdepartmental courses offered by the Faculty of Medicine are listed in detail in the Courses of Instruction section of the *Calendar*.

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, Introduction to Clinical Practice, Clinical Skills teaching (Interviewing and Physical Examination of the Normal), Medical Ethics, Medical Microbiology, Pathology, Behavioural Sciences in Medical Practice.
- Second Year — Interdepartmental Clinical Skills Courses emphasizing history taking and examination of the abnormal (Medicine, Surgery, Paediatrics, Obstetrics and Gynaecology, Psychiatry), Addiction Medicine, Medical Genetics, Medical Microbiology, Neuroanatomy, Neurophysiology, Ophthalmology, Orthopaedics, Pathology, Pharmacology.
- Third Year — Health Care and Epidemiology, Medicine, Obstetrics and Gynaecology, Ophthalmology, Paediatrics, Pharmacology and Therapeutics, Psychiatry, Diagnostic Radiology, Surgery (including subspecialties), Anaesthesiology, Addiction Medicine, and electives. There is a block format in the third year timetable which includes a four-week elective period as the final rotation.
- Fourth Year (Clinical Clerkship) — Medicine (including subspecialties), Obstetrics and Gynaecology, Paediatrics, Psychiatry, Addiction Medicine, Surgery (including sub-specialties, Ophthalmology, Orthopaedics and Anaesthesiology), approved electives and a one week Interdepartmental course.

Electives

Information concerning elective offerings may be obtained from the office of the Dean. In addition to formal courses offered by the Faculty of Medicine elective programs arranged by the student may be permissible in individual cases, subject to approval by the Faculty.

Attendance

Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, seminars, etc.). Students who are unavoidably absent because of illness or disability should report to the Dean's Office. A student *planning* to be absent from classes for *any reason* must obtain prior permission from the Dean's office.

Examinations

Examinations in the Faculty of Medicine may be held at various times throughout the year. These examinations are obligatory for all students.

Should a student be unavoidably absent from a sessional or final examination because of illness or other reason, the Dean's office must be notified 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.

When a sessional or final 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.

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 will be considered to have failed the course.

In any course which involves both laboratory work and written examinations, a student is required to achieve satisfactory standing in both parts of the course. If the course is repeated, no exemption will ordinarily be granted from the work in either part.

Term essays and examination papers may be refused a passing mark if they are illegible or noticeably defective in English.

The passing mark in the Faculty of Medicine is 60%.

All results of final examinations will be passed upon by a Promotions Committee. Final examination results will be released by the Registrar.

Subjects of the Final Examinations

- First Year — Anatomy (including Radiological Anatomy), Histology (including Embryology), Biochemistry, Physiology, Clinical Skills I, Family Practice, Medical Ethics, Pathology, and Behavioural Sciences in Medicine.
- Second Year — Anatomy (Neuroanatomy), Medicine, Paediatrics, Obstetrics, Psychiatry, Medical Microbiology, Pathology, Pharmacology, Physiology (Neurophysiology), Medical Genetics, and Surgery.
- Third Year — Promotion of students from third year to fourth year will be based on a continuing evaluation carried out by each Department during the third year and on results of written examinations, clinical oral examinations and the interdepartmental OSCE Examination.

The subjects in which students will be assessed in third year will be: Anaesthesia; Electives; Health Care and Epidemiology; Medicine; Therapeutics; Obstetrics and Gynaecology; Ophthalmology; Paediatrics; Psychiatry; and Surgery. Students will also be required to demonstrate satisfactory knowledge of radiological aspects of the above listed subjects

- Fourth Year (Medical Student Internship) — Medicine, Obstetrics and Gynaecology, Paediatrics, Psychiatry, and Surgery, (including subspecialties).

All persons writing the Medical Council of Canada examinations are required to submit a separate examination fee to that body. This fee is set by the Council and is payable to The Registrar, Medical Council of Canada.

Advancement

The Faculty will determine the student's fitness for promotion at the end of each session.

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.

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 that:

- 1) attendance has been satisfactory;
- 2) more than two subjects have not been failed; and,
- 3) an average of at least 60% in the work of the year including the failed subjects has been obtained.

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 or she will be promoted.

A student in the first year who fails to be promoted will not be permitted to repeat the year except under special circumstances.

A student will not be permitted to repeat more than one year except under special circumstances.

A student who repeats a year is required to attain a mark of at least 65% in the examination in each subject.

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 considered to be unsuited to proceed with the study or practice of medicine.

Medical Council of Canada Qualifying Examination

Application Forms and Information Kits are available through the Dean's office at the Vancouver Hospital and Health Sciences Centre.

Students planning to practice in British Columbia should make application to the Registrar, College of Physicians and Surgeons of British Columbia. Application should be made not later than March 1 in the final year of the medical course. Forms will be made available in the Dean's office, Vancouver Hospital and Health Sciences Centre. The credentials will be processed directly by the Registrar's Office.

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.

A student who has registered in another province should ordinarily obtain the Application Form and Information Kit from that province.

Graduation Requirements

A candidate for the M.D. degree must be at least 21 years of age; 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.

Each candidate for graduation must have passed all the required examinations in the subjects comprising the medical course, and have received acceptable ratings in certain courses for which satisfactory completion is required but specific marks are not assigned.

The Faculty will recommend to Senate the granting of the M.D. degree to a student who has completed satisfactorily the academic requirements.

Each candidate for the M.D. degree must make formal application, on a form obtainable at the Registrar's Office.

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 Licentiate 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.

To be eligible for licensure in B.C., graduates will be required to have completed at least two years of postgraduate training with at least eight weeks in each of Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, and four weeks in each of Emergency and Family Medicine and Psychiatry, in addition to being a Licentiate of the Medical Council of Canada.

Applicants with Certification by the College of Family Physicians of Canada or the Royal College of Physicians and Surgeons of Canada and being Licentiates of the Medical Council of Canada will also qualify for licences to practice.

Postgraduate Education

The Faculty of Medicine is prepared to assist and advise students in applying for postgraduate education positions. The Office of the Associate Dean, Undergraduate Education, should be consulted early in the final year for information on the application process.

Placement or assignment of postgraduate positions is not a function of the Faculty of Medicine. The Canadian Resident Matching Service in Ottawa performs this service for all applicants to PGY1 positions.

The Canadian Resident Matching Service (CaRMS)

All accredited postgraduate training in Canada is university integrated. Students do not apply to hospital programs but rather to university programs.

The matching service is a non-profit corporation that works in close cooperation with the Association of Canadian Medical Colleges. Since its establishment in 1970 it has matched every graduating class. CaRMS uses a computer program that quickly computes the traditional selection process for postgraduate training by matching students and programs with their highest possible choices. It guarantees the process to be fair and unbiased.

The CaRMS brochure and relevant documents for participation in the matching program are distributed annually, in July, to all final year medical students through the Dean's Office at the Vancouver Hospital and Health Sciences Centre, 910 West 10th Avenue. Further information is available from the CaRMS office, 151 Slater Street, Suite 802, Ottawa, Ontario, K1P 5H3.

Resident Education

Specialty training at the University of British Columbia is now offered in one of two streams, namely Family Medicine or a Royal College specialty program. Recruitment is now directly from medical school to these programs. A number of the Royal College programs still require a mandatory basic clinical year, and with this, designated positions are available and are assigned to the successful applicants. All training must be taken in institutions approved by the Royal College of Physicians and Surgeons of Canada or the College of Family Physicians of Canada. All

programs are totally integrated and directed by the University Faculty of Medicine. All residents are appointed by the British Columbia Interns and Residents Paying Agency and The University of British Columbia. All residents are required to register as postgraduate (resident) students of the University in order to receive accreditation for their training. Postgraduate courses are offered by individual departments or divisions of the Faculty of Medicine in 50 medical, surgical and laboratory specialties. These courses conform to the specialty training requirements of the Royal College of Physicians and Surgeons of Canada and the College of Family Physicians of Canada and are listed under *Calendar* numbers of 700 or higher.

Applications for resident staff appointments should be made to the Program Director of the appropriate division or department of the University.

Division of Continuing Medical Education

A Division of Continuing Medical Education has been established within the Office of the Dean. Its purposes are to: initiate and support programs in continuing medical education for physicians in practice, initiate and support health sciences inter-professional programs of continuing education, initiate and support efforts designed to define needs in continuing medical education, initiate and support programs of evaluation in continuing medical education, initiate and support experiments in new methods of learning in undergraduate and continuing medical education, and improve methods of information dispersal in continuing medical education leading to improved patient care.

Combined Programs

B.Sc. Degree and M.D. Degree

Students who have completed the third year in one of the approved degree programs of the Faculty of Science at UBC and the first year in the Faculty of Medicine at UBC, and who have completed **all** the course requirements of the degree program may be eligible for the appropriate B.Sc. degree. It is necessary that such students meet all of the specific course requirements of the departmental degree program and have the prior approval of the Head of the Department. Students should plan to meet these *specific* course requirements prior to their entrance into the Faculty of Medicine. With the approval of the Dean of Science up to 30 credits of course work in the Faculty of Medicine may be recognized for credit towards the B.Sc. degree.

Students in the Faculty of Medicine who wish to qualify for the B.Sc. degree must file a copy of their program in first-year Medicine with the Dean of Science by September 15 of the Winter Session of the year preceding the Fall in which they plan to qualify for the B.Sc. degree.

M.D. Degree and Ph.D. Degree

See "Medicine" in the Graduate Studies section of the *Calendar*.

Postgraduate (Residency) Training Programs

Postgraduate courses are offered by individual departments or divisions of the Faculty of Medicine, to graduates of Canadian medical schools. These courses satisfy the specialty training requirements of the Royal College of

Physicians and Surgeons of Canada and the College of Family Physicians of Canada and are approved as a prerequisite for the examinations in each specialty. All Residents must register as Postgraduate (Resident) students of the University.

The Royal College of Physicians and Surgeons of Canada requires a minimum of four to five years of specialty training dependent on the individual specialty. A broad base clinical PGY1 year is a mandatory component of many specialty programs but is not a requirement for entrance into such programs as paediatrics, internal medicine and the primary surgical specialties. Ongoing assessments are made through each of the training years and, on satisfactory completion of the program, candidates may apply to sit the certification examination of the Royal College of Physicians and Surgeons of Canada.

Candidates are eligible to sit the certification examinations of the College of Family Physicians of Canada upon completion of the two-year program.

Supervision of each training program is the responsibility of the university department or division concerned. Selection of candidates for each program is at the discretion of the Program Director of each department to whom application should be made.

The training programs run throughout the calendar year, commencing July 1. A variety of service rounds, conferences and seminars, small group tutorials, and divisional sessions having a bearing on patient care, but within which a teaching component is clearly defined, are offered.

For course descriptions see the Courses of Instruction section under the appropriate heading.

Anaesthesia

The postgraduate program in anaesthesiology, which is fully approved for Fellowship in the Royal College of Physicians and Surgeons of Canada, provides rotations in Clinical Anaesthesia, Internal Medicine and Basic Science or Clinical Research.

The clinical rotations of the five-year program involve a wide experience of general anaesthetic practice including the sub-specialties of paediatric, obstetric, cardiac and thoracic anaesthesia as well as experience in acute and chronic pain services. The resident is introduced to clinical responsibility in a graded manner, with the objective of becoming a consultant in anaesthesia in its broadest sense. An active academic core of Junior (second-year resident) and Senior (final two years) Tutorials, Seminars, Clinical Anaesthesia and Intensive Care Unit Rounds, Clinical Workshops, and Journal Clubs (see course instruction for details) are held weekly throughout the academic year. Clinical and academic evaluations are conducted on a day-to-day basis, as well as with formal written and oral examinations, held twice annually. The year of Internal Medicine emphasizes cardiovascular, respiratory, nephrology and haematology as well as rotations through intensive care units (adult, paediatric and neonatal).

The fifth and final year may involve a third year of clinical anaesthesia specialty rotations or a research and teaching fellowship in Physiology and Pharmacology or a clinical research fellowship in Anaesthesia at one of the several university affiliated teaching hospitals.

Community Medicine

Postgraduate training in Community Medicine consists of five years in an accredited Community Medicine training program. One year consists of basic clinical training. A

further clinical year is optional. The three core years consist of an academic year in the Department of Health Care and Epidemiology, where the resident becomes familiar with the sciences basic to Community Medicine such as epidemiology, biostatistics, community health and occupational medicine. Upon completion of the academic year, an M.H.Sc. may be conferred. The two further years consist of increasing responsibility in the areas of public health practice, clinical epidemiology, occupational health, basic research or health planning. Research is encouraged as a component of the program. Rotations are in Health Units, Ministry of Health or industry in B.C. Experience in international health may be obtained at the Caribbean Epidemiology Centre. Rounds and seminars are held each Friday on campus. Resident attendance at the academic day is required.

The selection of residents is carried out in October of the year before. The program is not part of the matching process, applications from practitioners are encouraged.

Family Practice

The Family Practice Residency is a two-year program in which the resident is given progressively increasing responsibility in patient care and management. Within the Family Practice Units and in community practices, residents are involved directly with ambulatory patients to whom they relate as family physicians and provide primary care on an episodic, continuing and preventative basis under the supervision of Department of Family Practice physicians. In addition, residents receive training in various hospitals in medicine, surgery, pediatrics, obstetrics and gynaecology, emergency, psychiatry, geriatrics and musculoskeletal medicine. Formal rounds, seminars, tutorials, daily chart rounds and Journal Clubs round out the resident's training in areas particularly pertinent to Family Practice. Training occurs at five different sites: Chilliwack, City (in Vancouver), Rural, St. Paul's and Victoria. An additional one-year training program of enhanced vocational skills is offered in emergency medicine, anaesthesia, maternal health, psychiatry, addiction medicine and surgical skills.

Medical Microbiology

The purpose of this approved residency program is to educate physicians to a level of competence that will enable them to direct the microbiology services in any hospital or other health care facility. Emphasis is placed on the appropriate delivery of diagnostic tests, infection control and consultation services to clinical colleagues who look after patients with infection. It is a five year program comprising a basic clinical year, two core years of medical microbiology, one year in an elective program approved by the director, and one year of approved clinical training in internal medicine or pediatrics including infectious diseases. The residency is one of five streams in the Department of Pathology and Laboratory Medicine and offers opportunities for interactions in the subdisciplines and specialties within Anatomic, General, and Neuro-pathology, and in Medical Biochemistry. Emphasis is placed on classical microbiological diagnostic strategies and molecular technologies.

Medicine (General)

The training program includes ward work and case conferences on General Medical and Subspecialty Ward services supervised by members of the Faculty. The Residents are given progressive responsibility for patient care on Medical Wards. Investigation and management of disease in ambulatory patients is provided under the direction of

Faculty Members in the General Internal Medicine and Medical Specialties.

The Department of Medicine utilizes the following facilities: the Vancouver Hospital and Health Sciences Centre—12th and Oak Site and UBC Site, St. Paul's Hospital, B.C. Cancer Agency, G. F. Strong Rehabilitation Center, and the Mary Pack Arthritis Center.

In the Department of Medicine and its subspecialties, courses will be given as indicated in the Courses of Instruction section of the *Calendar*. At present the following have training programs, in addition to the courses listed.

General Internal Medicine	Infectious Disease
Cardiology	Nephrology
Critical Care Medicine	Neurology
Dermatology	Medical Oncology
Endocrinology	Physical Medicine and Rehabilitation
Gastroenterology	Medicine
Geriatric Medicine	Respiratory Medicine
Haematology	Rheumatology

Nuclear Medicine

The objectives of this program are to provide up to four years' training in Nuclear Medicine for graduate physicians interested in a career in nuclear medicine in a community hospital or in an academic centre.

The core training program will consist of graduated experience in the divisions of nuclear medicine at the Vancouver Hospital and Health Sciences Centre, St. Paul's Hospital, Children's Hospital and the University Hospital-UBC Site, as well as in radiopharmacy. For individuals interested in an academic career, excellent research resources are available in all of the diagnostic imaging techniques including an extensive radiopharmaceutical preparation and research laboratory, an active research program into medically useful nuclides at TRIUMF, and positron emission tomography and single photon emission tomography facilities as well as other modalities such as nuclear magnetic resonance, ultrasound and computer assisted tomography. Staff include basic scientists in addition to physicians.

Obstetrics and Gynaecology

A balanced program of academic and practical clinical experience. The academic program consists mainly of weekly specialty rounds in the areas of gynaecology, gynaecologic oncology, high-risk pregnancy and fetal monitoring. Current cases and unusual clinical problems, together with their pathophysiology and management are discussed. A weekly afternoon seminar is held in which topics are assigned and prepared by residents and attending staff. Selected papers from the current literature are presented and critically discussed by the residents and the attending staff. Clinical experience is provided under supervision in the Ambulatory Care Clinics with graduated responsibility being provided in the performance of operating and case room procedures.

Ophthalmology

The Department offers practical experience in examination, investigation and management of patients in the neuro-ophthalmology, retina, cornea, glaucoma, refraction and contact lens, ocular plastic, genetic and low vision clinics under supervision in addition to general ophthalmology and paediatric ocular motility clinics throughout the week. Instruction and assistance is given in the practical performance of major and minor ophthalmic surgical procedures. The management of patients with emphasis on solving diagnostic problems and per-

formance of medical and surgical therapy is undertaken on both an in-patient and out-patient basis with follow-up clinics.

Orthopaedics

The Department offers a fully integrated five-year program leading to Certification by, and Fellowship of, the Royal College of Surgeons of Canada in the specialty of Orthopaedics. The program includes core experience in the Principles of Surgery (General, Plastic, Intensive Care, Vascular and Orthopaedics), as well as core and advanced training in the areas of General Orthopaedics, Adult Reconstruction, Musculoskeletal Oncology, Trauma, Sports Related and Arthroscopy, Hand and Microvascular, and Pediatric Orthopaedics (including trauma). Additionally, protected time in Basic Research (such as Biology or Bioengineering) is strongly encouraged.

The hospitals affiliated with the program include the Vancouver Hospital and Health Sciences Centre (12th and Oak and UBC Pavilions), the British Columbia's Children's, St. Paul's, and the Royal Columbian Hospitals.

Paediatrics

Education in Paediatrics is a graduated experience utilizing in-patient, ambulatory and community resources. Clinical, technical and communication skills are emphasized throughout. Supervisory, research and consultative skills are also taught and are given greater emphasis in the later years. The paediatric resident has access both to general paediatric patients and a wide variety of subspecialty patients providing a broad experience during training. Rounds occur daily and an Academic Half Day assures the residents freedom to attend interactive didactic sessions in basic and clinical science, clinical skills, bioethics and research methodology.

Pathology

Approved training is available in all subspecialties of laboratory medicine designed to fulfil the requirements of general or specialized pathology postgraduate programs. Residents will normally rotate through the major University teaching hospitals and are expected to accept increasing responsibilities as they progress. Weekly educational seminars within and between departments include active resident participation. Reviews of interesting cases are also a standard experience. Opportunities are available to gain skills and understanding on biotechnological and molecular applications in diagnoses, bioethics as pertinent to laboratory medicine and laboratory information management and administration. Residents' progress through the training program is regularly assessed.

Psychiatry

The Royal College of Physicians and Surgeons of Canada is responsible for setting the requirements of all medical postgraduate training in Canada. The Psychiatry Residency Program at The University of British Columbia operates under the Royal College guidelines.

There are 42 psychiatry residency positions. The academic year runs from July 1 to June 30. The program is now a five year program for applicants applying directly from a Canadian medical school through CARMS (Canadian Resident Matching Service), following successful completion of a four-year undergraduate program in medicine. The program may, on an ad hoc basis, be able to accommodate the so called mature or returning resident to a four-year program.

Clinical training takes place on hospital inpatient wards and at outpatient units. Mandatory rotations include: general hospital/OPD, child, chronic care, emergency, consultation-liason, geriatric and community psychiatry.

One day per week is dedicated to academic seminars at UBC campus.

The philosophy of our program is to train psychiatrists in the broad aspects of the bio-psycho-social model of medicine and psychiatry. Research, although not mandatory, is encouraged at each level of the resident's training.

Radiation Oncology (British Columbia Cancer Agency)

PGY-1

One year of approved basic clinical training. The purpose of this period is to introduce and expose the trainee to independent responsibility for decisions involving clinical judgment skills, the further development of an effective and mature physician patient relationship, and the achievement of competence in primary technical skills across a broad range of medical practice. The first year of an approved family medicine program is acceptable in fulfillment of this requirement. This year would precede subsequent specific training in radiation oncology.

PGY 2, 3 and 4

Three years of radiation oncology (36 months): BC Cancer Agency, Vancouver Clinic

- site specific rotations 10 to 12 weeks long: head and neck, gynecological oncology, lymphoma, breast, etc.
- weekly academic half day: didactic instruction in radiobiology pathology, physics, principles and practice of oncology.
- annual formal practice radiotherapy planning examinations.
- support for annual attendance at Northwestern Radiobiology Course (Seattle, Edmonton, Vancouver).
- support for one academic conference per year.
- mid-rotation constructive criticism sessions and end of rotation oral assessments.

PGY-5

One year, which may include six months of approved resident training in internal medicine, and six months of approved training in clinical or basic science or research training, relevant to the objectives of the specialty, and acceptable to the director of the residency program and to the Royal College at a hospital in Canada or abroad.

Research

For interested residents, six months of basic science or research can be incorporated: can attend weekly seminars at the BC Cancer Research Centre; annual departmental resident research project presentations.

Radiology

The postgraduate program in Radiology is a four-year program fully approved for certification and fellowship in the Royal College of Physicians and Surgeons of Canada. The first year provides core training in physics, chest radiology, gastrointestinal radiology, genitourinary radiology, musculoskeletal radiology, neuroradiology, computed tomography and ultrasound. During the second year the resident consolidates skills in film interpretation and the basic procedures by functioning as a general radiologist under appropriate supervision. A three month block of paediatric radiology is also included. During the third and fourth years, rotations are provided in nuclear

medicine, angiography, oncologic radiology, and magnetic resonance imaging. Assuming that the Royal College requirements are satisfied, the last two years provide opportunities for the resident to develop special expertise in any of the subspecialty areas or to develop a full-time research project. Residents are on-call to read emergency films. The academic program consists of daily rounds, weekly grand rounds and resident seminars during the academic year, a four year rotating series of core seminars, and a series of five or six internationally known visiting professors. Residents in their first and third years are expected to complete a research project, and residents in their second and fourth years are expected to present a grand round.

Surgery

Bedside Clinics for the discussion of problem cases are held regularly, including regular ward rounds and outpatient clinics. Progressive responsibility in patient care, operative instruction and experience, are given in each discipline.

The Department of Surgery has approved specialty training programs in the following specialties:

Cardio-Vascular and Thoracic Surgery	Paediatric General Surgery
Emergency Medicine	Plastic Surgery
General Surgery	Urology
Neurosurgery	Vascular Surgery
Otorhinolaryngology	

Bachelor of Medical Laboratory Science B.M.L.Sc.

This degree is granted upon the successful completion of a two year program.

The program consists of training in the theory and practice of Medical Laboratory Science with courses in human pathology, modern microscopy, normal human histology, haematology, medical microbiology, clinical chemistry, toxicology, nuclear medicine for medical laboratory scientists, immunopathology and laboratory administration in addition to the general application of basic science to the clinical disciplines of medical laboratory science.

Students should note that the B.M.L.Sc. degree program does **not** qualify students for the Canadian Society of Laboratory Technologists (R.T.) (general) diploma.

Admission

Applicants must meet the general admission requirements of the University. The Department of Pathology reserves the right of selection of all students admitted to this degree program.

Prerequisites

Students must meet the requirements of **either** A or B.

- A) 1) Graduation from an approved Institute of Technology (or College) with an approved two-year program in Medical Laboratory Technology, plus one year of in-hospital training in a C.M.A.-approved hospital laboratory, **and**
- 2) graduation with the Canadian Society of Laboratory Technologists (R.T.) (general) diploma, **and**
- 3) a) credit in CHEM 230 (or its equivalent) plus credit in one of CHEM 205, 201 or any other second-year level physical chemistry course which includes thermodynamics and kinetics, **or**
- b) credit in CHEM 230 (or its equivalent) plus six credits of arts electives.

Candidates admitted under option (a) must complete six credits of Arts electives in the first year of the program.

Candidates admitted under option (b) must complete CHEM 205 in the first year of the program.

- B) Applications will be considered from Science undergraduates or graduates who have passed the following courses or their equivalents: BIOL 110 and 120 (or BIOL 115 and 120); BIOL 200 and 201; CHEM 110 (or 121 and 122); CHEM 205, CHEM 230; MATH 100 and 101 (or 120 and 121); MICB 200; six credits of first-year Physics from PHYS 100, 101, 102; 121 or 122); six credits of approved first-year English; and six credits of Arts elective. Successful applicants must pass PATH 300 during the first session following entry.

English Requirement

In order to graduate from the program candidates must have completed six approved credits of first-year English. Courses taken to satisfy the English requirement will also satisfy six credits of Arts electives (12 Arts credits are required).

Note: Satisfactory completion of the Language Proficiency Index (LPI) is prerequisite to all first-year English courses at UBC. (See *Calendar* index under Language Proficiency Index.) Enquiries should be directed to the Department of Pathology, telephone (604) 822-7108.

Application and Registration

Any enquiries should be addressed to the B.M.L.Sc. Program Assistant, Department of Academic Pathology, The University of British Columbia, Ground Floor, Room 227, Acute Care Hospital, 2211 Wesbrook Mall, Vancouver, B.C. V6T 2B5.

Program

Third Year

Course	Credits	
CHEM 205	6	Physical, Inorganic and Analytical Chemistry ¹
CHEM 311	1	Instrumental Analysis
MMB 327	6	Bacteriology, Mycology, Virology and Parasitology
PATH 300	6	Background to Medical Laboratory Science ²
PATH 301	1	Introduction to Medical Laboratory Science
PATH 303	1	Principles of Tissue Culture, etc.
PATH 304	1	Normal Human Histology
PATH 305	1	Modern Microscopy
PATH 306	2	Nuclear Medicine for M.L.Sc.
PATH 375	2	Introduction to Human Pathology
	6	First-year English, or
	6	Arts electives ³

Fourth Year⁴

Course	Credits	
BIOL 300	or	
HCEP 400	3	Statistics in the Health Sciences
PATH 402	1	Haematology
PATH 403	6	Histochemistry
PATH 405	2	Seminars in Current Topics
PATH 406	6	Clinical Chemistry
PATH 407	1	Analytical, Clinical and Forensic Toxicology
PATH 408	3	Laboratory Administration
PATH 415	2	Immunopathology
	6	Arts electives, or
	6	First-year English ⁵

¹ R.T. applicants

² Science applicants only.

³ May be completed in fourth year.

⁴ An optional elective, PATH 438 (2 to 6 credits), is available to students in fourth year.

⁵ May be completed in third year.

Awards and Financial Assistance

A supplement to this *Calendar* entitled *Awards and Financial Aid* contains a list of current academic awards (scholarships, prizes, etc.) and available financial assistance (grants, bursaries and loans). Students are encouraged to consult the above section to determine awards for which they may be eligible. For further information and application forms contact the Awards Office, Room 101, General Services Administration Building, The University of British Columbia, 2075 Wesbrook Mall, Vancouver, B.C., V6T 1Z1, telephone (604) 822-5111.

Academic Staff

Office of the Dean

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 JAMES E. CARTER, M.B., Ch.B. (Cape T.), FRCP, Professor of Paediatrics, and Associate Dean, Admissions and International Relations.
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 DAVID F. HARDWICK, M.D. (Brit. Col.), FRCP, F.C.A.P., Professor of Pathology and Associate Dean, Research and Planning.
 DAVID S. IRENNAN, B.Sc., M.D. (Manit.), FRCP, F.A.C.P., Professor of Paediatrics, Associate Dean and Director of Continuing Medical Education.
 PEGGY ROSS, M.D., B.Sc.M., FRCP, Clinical Associate Professor of Anaesthesia and Associate Dean, Equity.
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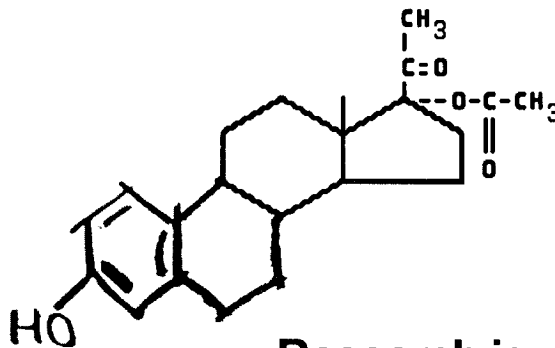
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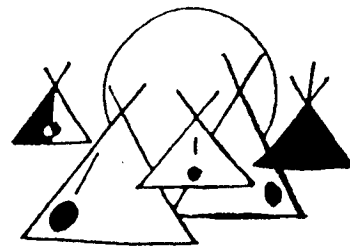
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Admission

The entering class may be limited for first-year music studies, and likewise for adequately qualified second- and third-year transfers. Therefore, it is essential for each prospective applicant to write a letter as soon as possible to the Undergraduate Admissions Officer, School of Music, indicating interest in being considered for admission. As soon as possible after February 1 the student should write for detailed information regarding pre-admission procedures and examination dates. The School will send forms which should be filled out and returned, one to the Registrar and another to the School's Undergraduate Admissions officer, with a copy of the applicant's (partial) transcript appended to each. Applicants should also request that two letters of recommendation be sent to the Undergraduate Admissions Officer, The University of British Columbia, School of Music, 6361 Memorial Road, Vancouver, B.C., V6T 1Z2. At least one of these should be from a music teacher. Applicants for transfer from other universities or regional colleges should request a letter of recommendation from the department head or senior counsellor of that institution. All letters should be sent directly by the referee and under no circumstances should pass through the hands of the applicant.

All applicants for admission to the University to major in music in the Bachelor of Music programs must meet the pre-admission requirements of the School of Music, which generally include an entrance examination in music theory and aptitude and a performing audition, as well as the academic requirements for admission to the University. The School's examinations and auditions must be taken at the scheduled times in the spring. Acceptance for admission is based on the total evaluation of the skills and preparation of each applicant. Only those students who fulfil both the University and School requirements for admission and meet the University deadline for submitting formal applications for admission will be considered for admission to the Winter Session Bachelor of Music major program.

Performing Organizations

All students in the Bachelor of Music programs participate in the large and small instrumental and choral ensembles sponsored by the School of Music to develop their skill as musicians and to experience a wide range of repertoire. The ensembles are also open to qualified non-music majors, who may be accepted by audition and who may receive credit for participating (consult Faculty listings). The ensembles are the University Singers, University Choral Union, University Symphony Orchestra, University Wind Ensembles, University Opera Workshop and Theatre, the Contemporary Players, the Asian Music Ensemble, the Stage Band, the Collegium Musicum Ensembles, and various chamber groups. No more than half of a student's small ensemble credit is to be in Stage Band. Where the term "large ensemble" is used in lists of degree requirements, it refers to MUSC 150 (Large Instrumental Ensemble), 153 (University Singers), and 154 (University Choral Union).

Specific ensembles may tour extrasessionally. Student participation in such tours, while desirable, is not obligatory. Students should inform ensemble directors of their plans as early as possible in the Winter Session.

Recitals by Faculty and Students

- *Faculty Recitals* — Members of the Faculty present formal recitals throughout the academic year. All students in the B.Mus. program are expected to attend.

The School of Music

A School within the Faculty of Arts.

The School of Music offers programs of study in performance and composition, leading to the B.Mus., the M.Mus., and the D.M.A., as well as programs in musical scholarship, leading to the B.Mus., the M.A., and the Ph.D. The School also offers B.Mus. programs designed for prospective school teachers, elementary and secondary. All B.Mus. programs have a performance component. For students with a strong interest in music but little background in performance, the School offers the B.A. with a Major or Honours in Music. A description of the various Major Programs within the B.Mus. follows. For a description of the B.A. degree, see listing in the Faculty of Arts section of the *Calendar*. For graduate degrees, see listing under the Faculty of Graduate Studies.

- *Wednesday Noon-Hour Recitals* — On many Wednesdays, recitals feature outstanding soloists and chamber ensembles. Students in the B.Mus. program are expected to attend.
- *Student Repertory Series* — Informal recitals are held each week throughout the academic year on Tuesday afternoons at 12:30 in the Recital Hall of the Music Building. All students in the B.Mus. program are expected to attend and to participate as their instructors recommend.
- *Student Recital Series* — More formal recitals are presented occasionally during the academic year. Normally several students will share one of these periods on the recommendation of the faculty. Attendance is expected of students majoring in performance.
- *Graduation Recitals* — All students of composition and performance (except opera) must present full-length graduation recitals in partial fulfilment of their requirements. All students in the B.Mus. program are expected to attend.
- Sight-reading at the approximate difficulty of Toronto or Western Board Grade V.
- Transposition of pieces at the above sight-reading level to most other keys.
- Improvisation of accompaniments utilizing more extensive harmonic and contrapuntal vocabulary (melody and accompaniment; accompaniment alone).
- Complete scales in any mode (including major and minor), two octaves, hands together.
- Keyboard sequences, including scale harmonization, seventh chords in the key, and circles of dominant sevenths (any key).

Annual Review in the Performance and Composition Majors

All students enrolled in the performance and composition major programs will be reviewed annually to determine whether they should be allowed to continue in their course of study.

Non-Music Electives

The non-Music elective requirements in each major within the B.Mus. degree must be satisfied by taking courses available for credit in the Bachelor of Arts degree, that is, all courses in the Faculties of Arts (other than Music courses) and Science and those listed under "Courses in Other Faculties or Degree Programs" in the Faculty of Arts section of the *Calendar*.

English Requirement

To qualify for the B.Mus. degree, students must successfully complete six credits of first-year English. Students who have not satisfied this requirement by the time they have completed the number of credits in the first three years in the student's major may not re-register in the program until the requirement has been satisfied.

Satisfactory completion of the Language Proficiency Index (LPI) examination is prerequisite to all first-year English courses at UBC. (See *Calendar* index under Language Proficiency Index.)

Transfer Credits

Students intending to transfer to UBC from other institutions should plan their programs of study carefully to match, as nearly as possible, the majors outlined here,

Minimum Achievements in Piano

Where piano is neither the *major* nor the *concentration* instrument, the student will be expected to demonstrate, normally by taking piano as a *secondary* instrument, the following achievement levels at the ends of the first and second years:

End of First Year

- Independently-prepared repertoire at the approximate difficulty of Toronto or Western Board Grade IV.
- Sight-reading at the approximate difficulty of Toronto or Western Board Grade III.
- Transposition of pieces at the above sight-reading level to most other keys.
- Improvisation of accompaniments using common-practice harmonics and/or contemporary techniques (melody and accompaniment; accompaniment alone).
- Any scale or mode with a tetrachord in each hand; major, minor, Phrygian, Lydian and Locrian pentachords from any note (both hands); cadences in all keys.

End of Second Year

- Independently-prepared repertoire at the approximate difficulty of Toronto or Western Board Grade VII.

including both music and non-music courses. The *College-University Transfer Guide*, published by the Registrar's Office, should be consulted to determine the transferability of specific courses. The year and major to which a transfer student is admitted are based upon both the number of transferable courses and the student's performance ability, as determined by the entrance audition. Therefore, the number of transfer credits awarded for instrumental (or composition) study may be less than the number of corresponding credits the student has taken at other institutions. Transfer credit awarded for ensemble performance cannot be used to satisfy the ensemble requirements for the third and fourth years.

Major: Composition

This four-year program is formulated for the student with particular capabilities in musical composition.

A student will not be allowed to enrol in this program unless ability in composition has already been demonstrated by submitting original scores to the Composition Division.

Composers will have opportunities 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 program of approximately 45 minutes of original music approved by the School of Music.

Two copies of each approved work must be presented to the School of Music, for retention in the Music Library. All presentation copies must be inked or reproduced for permanence.

First Year

Course	Credits
MUSC 107	6 Composition I ¹
MUSC 100	2 Theory of Music I
MUSC 101	2 Theory of Music II
MUSC 105	2 Aural Skills I
MUSC 120	3 Music in Society
MUSC 121	3 History of Music I
	1 Music Performance ²
	2 Ensemble ³
	6 First-year English
	6 Non-Music Elective(s)
	6 Literature Requirement
Total	36

Second Year

Course	Credits
MUSC 207	6 Composition II
MUSC 200	2 Theory of Music III
MUSC 201	2 Theory of Music IV
MUSC 205	2 Aural Skills II
MUSC 220	3 History of Music III
MUSC 221	3 History of Music IV
	1 Music Performance ²
MUSC 309	2 Orchestration
MUSC 310	2 Orchestration
	3 Ensemble ³
Total	35

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI
MUSC 307	6 Composition III
	4 Music Performance ²
	2 Ensemble ³
	6 Music Elective ⁴
	12 Non-Music Elective(s)
Total	36

Fourth Year

Course	Credits
	6 Theory Electives ⁵
MUSC 407	6 Composition IV (Recital)
	4 Music Performance ²
MUSC 306	4 Conducting
	6 Music Elective
	6 Non-Music Elective(s)
Total	32

¹ *Composition I:* It is possible to commence a Major in composition after one year in another field. In such a case the Composition Division will decide whether the student must take all four composition courses.

² *Music Performance:* At least two credits of piano is required each year. Students may study either at the concentration level (182, 282, 382, 482) or at the secondary level (172, 272, 372, 472). If concentration is elected they will be expected to meet jury requirements.

³ *Ensemble:* The ensemble requirement for the four years is defined as three credits of large ensemble, two credits of small ensemble, and two credits of either.

⁴ *Music Elective:* MUSC 328 (at least three credits) is recommended as the third-year music elective.

⁵ Students will choose two courses from MUSC 410-415.

Major: General Studies

This curriculum is designed to provide a general higher education in music, including performance, and to prepare students for professional work in a wide variety of fields such as criticism, broadcasting, editing, and arts management. The degree will allow continuation toward graduate degrees.

All applicants for the Major in General Studies will be required to audition on the instrument of their greatest competence. Students are required to study for four years in a concentration of their own choice; possibilities are piano, organ, voice, guitar, harp, strings, woodwinds, brass, percussion, and some historical instruments such as harpsichord, lute, viola da gamba, early flutes, recorder, and other instruments as instruction is available. Students interested in preparing to teach music in B.C. schools should see Major in General Studies: Secondary Education Stream, or Major in General Studies: Elementary Education Stream.

First Year

Course	Credits
MUSC 100	2 Theory of Music I
MUSC 101	2 Theory of Music II
MUSC 105	2 Aural Skills I
MUSC 120	3 Music in Society
MUSC 121	3 History of Music I
MUSC 182	4 Music Performance (Concentration) ¹
MUSC 171	2 Music Performance (Secondary) ²
	3 Large Ensemble ³
	6 First-year English
	6 Non-Music Elective(s) ⁴
Total	33

Second Year

Course	Credits
MUSC 200	2 Theory of Music III
MUSC 201	2 Theory of Music IV
MUSC 205	2 Aural Skills II
MUSC 220	3 History of Music II
MUSC 221	3 History of Music III
MUSC 282	4 Music Performance (Concentration) ¹
MUSC 271	2 Music Performance (Secondary) ²
	3 Large Ensemble ³
	6 Literature Requirement
	6 Non-Music Elective(s) ⁴
Total	33

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI

MUSC 382	4 Music Performance (Concentration) ¹
	3 Large Ensemble ³
	Small Ensemble ³
	14 Music Electives ⁵
	6 Non-Music Elective(s) ⁴
Total	33

Fourth Year

Course	Credits
MUSC 482	4 Music Performance (Concentration) ¹
	3 Large Ensemble ³
	Small Ensemble ³
	14 Music Electives
	9 Non-Music Elective(s) ⁴
Total	30

¹ The concentration instrument is usually the one on which the student is most competent, and on which the student auditioned to enter the School.

² The secondary instrument is normally piano in the first two years unless the concentration is a keyboard instrument. Students with minimal keyboard experience will be placed initially in MUSC 141 (Class Piano I), and will in the second year take MUSC 241 (Class Piano II) or MUSC 271 (private), as determined by the level of achievement in MUSC 141. Students with some previous piano experience may be excused from all or part of the piano requirement by showing satisfactory proficiency in all of the second-year secondary piano requirements: technique, repertoire, keyboard harmony, score reading, sight reading, and transposition. (For details, consult the faculty coordinator, keyboard performance division.)

³ The large and small ensembles chosen are normally those most appropriate to the student's concentration instrument. Substitutions can occasionally be made after consultations with the student's adviser, and with some consideration being given to the needs of the ensembles. **Students with concentrations in historical instruments will take six credits of small ensemble (usually Collegium Musicum, starting in the second year) and six credits of large ensemble.** In each of third and fourth years a total of 14 credits, comprised of small ensemble and music electives, must be taken with a minimum of two credits and a maximum of six credits of small ensemble. The two credit small ensemble minimum may be waived if inappropriate to the concentration instrument or to the needs of the student, or decision of the Director, School of Music, the Music Electives will be increased from 12 to 14 credits. Extra credits of large ensemble beyond those required for this Major may not be used as Music Electives.

⁴ The non-music electives may be freely chosen, except that at least 12 credits must be in the same department, with at least six of these at the 200-level or higher. If English is chosen to fill this requirement then 12 credits must be selected beyond those necessary to complete the literature requirement.

⁵ **Students with keyboard concentrations must take MUSC 149. Those with harpsichord concentrations must take MUSC 233 and 333.** Those wishing to concentrate on historical instruments are advised to take 12 credits of music history courses from MUSC 350, 352, 353, 354, and 355) as part of their Music Elective. Provided authorization is given by the Director, School of Music, students may take a minimum of two credits of Music Performance (Secondary) in each of the third and fourth years, in partial fulfillment of the Music Elective requirements in those years.

Major: General Studies: Elementary Education Stream

This curriculum is a preparation for studies in education leading to certification as a teacher in B.C. elementary schools. It is intended for those who expect to become elementary music **specialists** as opposed to general classroom teachers. Students interested primarily in general classroom teaching should consider the B.A. with a Major in Music. The following program, leading to a B.Mus., is for those who expect to be full-time music teachers in the elementary schools. Students who successfully complete this program will have the prerequisites for admission to the professional program in elementary education in the Faculty of Education.

The curriculum is based on that of the **Major in General Studies**, with the following differences:

- *Second Year* — Students must take MU'ED 106, (two credits), for a total of 34 credits.

- *All Years* — Large Ensemble: for instrumental concentrators, one of these, in the four years, must be a choir, and the remaining three will be a Large Instrumental Ensemble.

Students should consult the Faculty of Education requirements for admission to the Teacher Education Program

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI
	6 Music Electives ¹
MUSC 311	1 Conducting or MUSC 312
MUSC 382	1 Music Performance
	3 Large Ensemble
MUSC 102	2 Instrumental Class or MUSC 112 or 122
	6 Non-Music Electives ²
	1 Music Education Electives
Total	35

Fourth Year

Course	Credits
	6 Music Electives ²
MUSC 182	1 Music Performance
	3 Large Ensemble
MUSC 131	2 Class Voice ³
MUSC 102	2 Instrumental Class or MUSC 112 or 122
	12 Non-Music Electives ²
	4 Music Education Electives
Total	33

¹ Any appropriate history, theory, or composition course may be elected. A maximum of two credits of small ensemble and two credits of secondary performance may be elected.

² The music electives in fourth year must be in history, theory, or composition.

³ Students are required to take MUSC 131 (Class Voice) if they have had no previous vocal instruction. Vocal concentrators will take an appropriate level of some secondary instrument. Vocal secondaries will take the appropriate level of voice secondary.

Major: General Studies: Secondary Education Stream

This curriculum is a preparation for studies in education leading to certification as a music teacher in B.C. secondary schools. Successful completion of the program, or a program with comparable requirements, is a prerequisite for admission into the B.Ed. (Secondary) program of the Faculty of Education, with music as the major teaching field.

The curriculum is based on that of the Major in General Studies (see above), with the following differences:

- *First Year* — Students must take MU'ED 106, (two credits).
- *Second Year* — Students must take MUSC 122 (Class Woodwinds), (two credits).
- *All Years* —
 - 1) *Large Ensemble*: for instrumental concentrators, one of these, in the four years, must be a choir, and the remaining three will be Large Instrumental Ensemble.
 - 2) *Non-Music Electives*: students should consult the Faculty of Education for distribution requirements.

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI
MUSC 311	1 Conducting or MUSC 312
MUSC 309	2 Instrumentation
MUSC 112	2 Class Brasses & Percussion
MUSC 382	1 Music Performance (Concentration)
MUSC 371	2 Music Performance (Secondary)
	3 Large Ensemble
	2 Small Ensemble

	1 Music Electives ¹
	6 Non-Music Electives ² (see above)
Total	35

Fourth Year

Course	Credits
MUSC 182	1 Music Performance (Concentration)
	2 Music Performance (Secondary) ²
	3 Large Ensemble
MU'ED 101	2 Music Education
MU'ED 302	1 Music Education
MU'ED 303	1 Music Education
	12 Non-Music Electives ² (See Above)
	3 Music Electives
Total	34

¹ Two credits of the Music Elective may be in additional small ensemble work. MUSC 102 (Class Strings) is recommended as an elective for string players.

² Voice concentrators take an appropriate level of their secondary instrument; those with previous secondary voice instruction, take an appropriate level of voice or of the secondary instrument begun in the third year; those without previous voice instruction, take MUSC 131 (Class Voice).

³ Students with some background in strings are strongly encouraged to take MUSC 102 (Class Strings). Otherwise, any course of the correct credit value, apart from private performance instruction, may be selected.

Major: Guitar

All students planning to major in guitar in the Bachelor of Music program are required to audition just prior to the beginning of classes. Transfer students from other colleges and universities will audition at the same time. The auditions will determine the admission of students to the performance program and whether they will be allowed to transfer credits in guitar performance from other universities and colleges.

In general, the entrance level corresponds to the Toronto or Western Board Grade X, and there must also be the probability of significant development during the years of study at the University. The possession of a diploma is not a guarantee of acceptance.

Students accepted as first-year guitar majors will be expected to attain annual levels corresponding approximately to those given below. The works cited are given as guides to the levels of technical and musical achievement to be attained and do not indicate specific repertoire requirements.

Entrance auditions and term examinations will include sight reading and quick study in addition to the performance of prepared repertoire. Third-year students will be required to study French and Italian lute tablature systems (in their private lessons). Fourth-year students will be expected to transcribe a work from the repertoire of another instrument (e.g. piano, violin).

- *End of First Year* — Etudes (Villa-Lobos: No. 1, Mignone: No. 10); Dowland: Lacrimae Pavan; Weiss: Fantasia; Sor: Fantasia Op. 7; Berkeley: Theme and Variations.
- *End of Second Year* — Etudes (Villa-Lobos: No. 6, Sor: [Segovia] No. 12); Dowland: Fantasia; Bach: Third Lute Suite; Somers: Sonata; Torroba: Suite Castellana.
- *End of Third Year* — Etudes (Villa-Lobos: No. 2, Dodgson: [Quine] No. 20); Bach: Prelude, Fugue and Allegro; Sor: Sonata Op. 22; Walton: Bagatelles; Concertos (e.g., Castelnuovo-Tedesco); vocal and instrumental accompaniments; chamber works. Third-year recital.
- *End of Fourth Year* — Etudes (Villa-Lobos: No. 10, Mignone: No. 3); Bach: Fourth Lute Suite; Castelnuovo-Tedesco: Sonata; Britten: Nocturnal; Bolcom: Seasons; Concerto (e.g. Rodrigo: Aranjuez); vocal and instrumental accompaniments; chamber works. Fourth-year recital.

First Year

Course	Credits
MUSC 100	2 Theory of Music I
MUSC 101	2 Theory of Music II
MUSC 105	2 Aural Skills I
MUSC 120	3 Music in Society
MUSC 121	3 History of Music I
MUSC 193	6 Music Performance (Guitar)
MUSC 171	2 Piano ¹
	3 Large Ensemble ²
MUSC 160	2 Small Ensemble ³
	6 First-year English
	3 Non-Music Electives ²
Total	34

Second Year

Course	Credits
MUSC 200	2 Theory of Music III
MUSC 201	2 Theory of Music IV
MUSC 205	2 Aural Skills II
MUSC 220	3 History of Music II
MUSC 221	3 History of Music III
MUSC 293	6 Music Performance (Guitar)
MUSC 271	2 Piano ¹
	3 Large Ensemble ²
MUSC 160	2 Small Ensemble ³
	6 Literature Requirement
	3 Non-Music Electives ²
Total	34

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI
MUSC 363	4 History & Repertoire of Guitar
MUSC 394	8 Music Performance (Guitar Recital)
	2 Small Ensemble ⁴
	6 Music Electives
	6 Non-Music Electives ²
Total	32

Fourth Year

Course	Credits
MUSC 494	8 Music Performance (Guitar Recital)
	2 Small Ensemble ⁴
	6 Music Electives
	12 Non-Music Electives ²
Total	28

¹ The secondary instrument will be piano except where a student elects another instrument after having met in full the Minimum Achievements in Piano for second year. Secondary piano students will be auditioned. Those judged to have insufficient background to require private study will be placed initially in MUSC 141 (class), and will, in second year, take either MUSC 241 (class) or MUSC 271 (private) as determined by the level of achievement in 141.

² *Large Ensemble*: Students may elect any one of MUSC 150, 153, or 154, with the permission of the School.

³ It is often desirable that students take the guitar ensemble section of MUSC 160 in each of the first and second years, and that they either continue with the ensemble or elect one of the following courses in each of the third and fourth years: MUSC 156, MUSC 165, MUSC 165. Should appropriate small ensemble courses not be available in any given year, the required credits will be waived and the Music Elective requirement increased correspondingly.

Major: Music History and Literature

This four-year curriculum is formulated for the student planning to continue after graduation in the area of musicology and wishing to obtain graduate degrees in music with the ultimate aim of teaching in a university.

The student in this area must obtain a wide theoretical knowledge, a comprehensive background in musical history, and a working knowledge of piano, and should possess an intense interest in other musical areas, art, literature, and philosophy. A reading knowledge of both French and German is required before graduation.

As university professors often instruct in more than one musical field, a student in this program should obtain strength in at least one additional musical area, such as performance or theory. These areas may be strengthened further in graduate study.

Very few students will know whether they are suited for this program 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.

First Year

Course	Credits
MUSC 100	2 Theory of Music I
MUSC 101	2 Theory of Music II
MUSC 105	2 Aural Skills I
MUSC 120	3 Music in Society
MUSC 121	3 History of Music I
	1 Music Performance ¹
	3 Large Ensemble ²
	6 First-year English
	6 French or German ³
Total	31

Second Year

Course	Credits
MUSC 200	2 Theory of Music III
MUSC 201	2 Theory of Music IV
MUSC 205	2 Aural Skills II
MUSC 220	3 History of Music II
MUSC 221	3 History of Music III
	4 Music Performance
	3 Large Ensemble
	6 Literature Requirement
	6 French or German
Total	31

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI
	1 Music Performance
	2 Small Ensemble ⁴
	12 Music History ⁵
	6 History ⁶
Total	30

Fourth Year

Course	Credits
	6 Theory Electives ⁷
	4 Music Performance
	2 Small Ensemble
	12 Music History ⁸
	12 Non-Music Electives ⁹
Total	36

¹ *Music Performance*: Students must study in some field of performance, which must include piano unless the student can demonstrate proficiency commensurate with requirements of MUSC 241 (Class Piano II) to the satisfaction of the keyboard division. (For details of requirements of MUSC 241, address inquiry to the faculty coordinator, keyboard performance division.) Performance fields include voice, piano, orchestral instruments, and some historical instruments such as harpsichord, lute, viola da gamba, early flutes, recorder, and other instruments as instruction is available. Students may study performance either at the concentration level (MUSC 182, 282, 382 and 482) or at the secondary level (MUSC 172, 272, 372 and 472). If MUSC 182, 282, 382 or 482 is chosen, the student is expected to meet jury requirements.

² *Large Ensemble*: Students will enroll in MUSC 150 (Large Instrumental Ensemble), 153 (University Singers), or 154 (University Choral Union), depending on the student's major performance field.

³ *Languages other than English*: If one of these languages was studied in secondary school, it is recommended that the other be taken at the University.

⁴ *Small Ensemble*: To be elected depending the student's performing field.

⁵ *Music History Electives*: To include MUSC 350, 352, 353, 354, 355, 356 and 357.

⁶ *History*: While there is no limit to the amount of political and social history the musicologist should know, the student is advised to take at least one general history course after consultation with the School of Music.

⁷ *Theory Electives*: Students will choose two courses from MUSC 410-415; in exceptional circumstances MUSC 402, *Special Projects*, may be substituted for one or both of these.

A course in the history of fine arts is strongly recommended.

Major: Music Theory

The program effectively begins in the third year of undergraduate study since in the first two years the student takes a general program. In order to be admitted to the Major in theory, except by special permission of the division, the student must have at least an overall 68% average in each of the first two years, and at least an 80% average in MUSC 100, 101, 200 and 201.

Requirements for graduation with the B.Mus. in Music Theory include: 1) overall second-class average in each of the third and fourth years, and 2) successful completion of a fourth-year theory project. This project will be undertaken as MUSC 402 or 419, but the work should be read and approved by one faculty member in addition to the 402 or 419 supervisor. In appropriate cases the project may involve composition or performance.

First Year

Course	Credits
MUSC 100	2 Theory of Music I
MUSC 101	2 Theory of Music II
MUSC 105	2 Aural Skills I
MUSC 120	3 Music in Society
MUSC 121	3 History of Music I
	1 Music Performance ¹
MUSC 141	2 Class Piano ²
	3 Large Ensemble
	6 First-year English
	6 Non-Music Electives ³
Total	33

Second Year

Course	Credits
MUSC 200	2 Theory of Music III
MUSC 201	2 Theory of Music IV
MUSC 205	2 Aural Skills II
MUSC 220	3 History of Music II
MUSC 221	3 History of Music III
	1 Music Performance ⁴
MUSC 241	2 Class Piano
	3 Large Ensemble
	6 Literature Requirement
	6 Non-Music Electives ⁵
Total	33

Third Year

Course	Credits
MUSC 300	3 Theory of Music V
MUSC 301	3 Theory of Music VI
MUSC 407	6 Composition I
	4 Music Performance ⁶
	2 Large or Small Ensemble
MUSC 419	2 Keyboard Harmony
	12 Non-Music Electives ⁷
Total	32

Fourth Year

Course	Credits
	6 Theory Electives ⁸
MUSC 309	2 Instrumentation
MUSC 310	2 Orchestration
	4 Music Performance ⁹
	2 Large or Small Ensemble
	9 Music Electives ¹⁰ and Theory Project ¹¹
	6 Non-Music Electives ¹²
Total	31

¹ The music performance requirement will be fulfilled by four years of study on the student's principal instrument. Students may study performance either at the concentration level (MUSC 182, 282, 382 and 482) or at the secondary level (MUSC 172, 272, 372 and 472). If MUSC 182, 282, 382 or 482 is chosen, the student is expected to meet jury requirements.

² MUSC 141 and 241 (Class Piano) will be required of students whose principal instrument is not a keyboard instrument. The purpose is to prepare students for the study of keyboard harmony in the third year. Students with some keyboard background may be allowed to take MUSC 171 and 271 (Piano) instead. Students whose principal instrument is a keyboard instrument will not study a secondary instrument except as an extra course.

³ The program provides for 30 credits of non-Music electives, or 27 credits of non-Music electives and PHYS 341. PHYS 341 must be taken if offered. Students must have at least 12 credits in one department other than Music. If English courses are elected to complete this 12 credit concentration requirement, they must be in addition to first-year English and the literature requirement. In addition to these elective requirements, it will be advisable for students contemplating graduate study in theory to study some German.

⁴ Fourth-year students have the option of choosing six credits of music electives and doing a one-term, three-credit 402 project, or of choosing only three credits of music elective and doing a two-term project (as MUSC 419) for six credits. Appropriate scope for the project will be the determining factor here, and will be decided by the student and the adviser in consultation.

⁵ Students will choose two courses from MUSC 410-415.

Major: Opera

This course of instruction is limited to those students wishing to pursue a career in either performance or production of opera. A successful audition and interview with the director of opera prior to enrolment in course work is required of all prospective Opera majors.

- *First Year* — Vocal development, musicianship, and tone production are emphasized. Stress is laid on vocal materials best suited to the student's individual requirements and development. Exploration of operatic styles is begun.
- *Second Year* — Technical and interpretive vocal studies are continued. Further exploration of styles in both song and operatic literature is stressed.
- *Third Year* — Considerable vocal development is expected. Production and performance of operatic scenes or complete operas become a part of the student's curriculum. Emphasis on good singing techniques is continued. An increasing number of operatic arias is required as part of the student's vocal repertoire. Styles continue to be stressed. Practical work in movement and acting for the lyric stage is introduced.
- *Fourth Year* — Continued emphasis on vocal techniques especially on the vocal-dramatic techniques of operatic vocal literature. Operatic acting skills are further developed. Considerable understanding of representative operatic styles is expected. Performance and production of scenes or complete operas continue.

First Year

Course	Credits
MUSC 100	2 Theory of Music I
MUSC 101	2 Theory of Music II
MUSC 105	2 Aural Skills I
MUSC 120	3 Music in Society
MUSC 121	3 History of Music I
MUSC 192	4 Music Performance (Voice)
MUSC 171	2 Piano ¹
MUSC 155	2 Opera Repertoire I
	3 Large Ensemble
	6 First-year English
	6 Italian ²
Total	35

Second Year

Course	Credits
MUSC 200	2 Theory of Music III
MUSC 201	2 Theory of Music IV
MUSC 205	2 Aural Skills II
MUSC 220	3 History of Music II
MUSC 221	3 History of Music III
MUSC 292	4 Music Performance (Voice)

MUSC 271	2	Piano
MUSC 235	2	Opera Repertoire II
	3	Large Ensemble
	6	Literature Requirement
	6	German ²
Total	35	

Third Year

Course	Credits	
MUSC 300	3	Theory of Music V
MUSC 301	3	Theory of Music VI
MUSC 339	6	Opera Workshop I
MUSC 393	6	Music Performance (Voice)
MUSC 335	2	Opera Repertoire III
MUSC 336	4	Opera Theatre Tech.
MUSC 170	2	Lyric Diction
	6	French ²
Total	32	

Fourth Year

Course	Credits	
MUSC 493	6	Music Performance (Voice)
MUSC 439	6	Opera Workshop II
MUSC 454	3	History of Opera I
MUSC 455	3	History of Opera II
MUSC 455	2	Opera Repertoire IV
	6	Music Elective
	6	Non-Music Elective(s) ³
Total	32	

¹ The secondary instrument will be piano except where a student elects another instrument after having met in full the Minimum Achievements in Piano for second year. Secondary piano students will be auditioned. Those judged to have insufficient background to require private study will be placed initially in MUSC 141 (class), and will, in second year, take either MUSC 241 (class) or MUSC 271 (private) as determined by the level of achievement in 141.

² *Foreign languages:* In certain cases students may concentrate on one or two of the languages required, and the indicated sequence may be altered.

³ *Non-Music Electives:* To be chosen in consultation with opera division adviser.

Major: Orchestral Instrument

The Major in an Orchestral Instrument is formulated for the student who plans to become a professional performer or a teacher in schools of music or private studios.

Before entering this course of study, the student must successfully audition for the School. In general, the entrance level corresponds to the Toronto or Western Board Grade X and there must also be the probability of significant development during the years of study at the University.

Although solo performance is stressed, all students in this program will constantly participate in large and small ensemble activity. Solo recitals are required at the end of the third and fourth years.

A detailed syllabus of repertoire representing standards of expectation in performance during undergraduate study is available on application to the School of Music.

First Year

Course	Credits	
MUSC 100	2	Theory of Music I
MUSC 101	2	Theory of Music II
MUSC 105	2	Aural Skills I
MUSC 120	3	Music in Society
MUSC 121	3	History of Music I
MUSC 193	6	Music Performance
MUSC 171	2	Piano ¹
MUSC 150	4	Large Instrumental Ensemble
	2	Small Ensemble ²
	6	First-year English
Total	32	

Second Year

Course	Credits	
MUSC 200	2	Theory of Music III
MUSC 201	2	Theory of Music IV

MUSC 205	2	Aural Skills II
MUSC 220	3	History of Music II
MUSC 221	3	History of Music III
MUSC 293	6	Music Performance
MUSC 271	2	Piano ¹
MUSC 150	4	Large Ensemble
	4	Small Ensembles
	6	Literature Requirement
Total	34	

Third Year

Course	Credits	
MUSC 300	3	Theory of Music V
MUSC 301	3	Theory of Music VI
MUSC 394	8	Music Performance (Recital)
MUSC 150	4	Large Ensemble
	6	Chamber Ensembles ²
	12	Non-Music Electives ³
Total	36	

Fourth Year

Course	Credits	
MUSC 494	8	Music Performance (Recital)
MUSC 150	4	Large Instrumental Ensemble
	6	Small Ensemble
	6	Music Elective ³
	6	Non-Music Elective(s)
Total	30	

¹ The secondary instrument will be piano except where a student elects another instrument after having met in full the Minimum Achievements in Piano for second year described above. Secondary piano students will be auditioned. Those judged to have insufficient background to require private study will be placed initially in MUSC 141 (class), and will, in second year, take either MUSC 241 (class) or MUSC 271 (private) as determined by the level of achievement in 141.

² *Small Ensemble:* A minimum of three years of MUSC 160 (String Chamber Ensembles) or MUSC 162 (Wind and Percussion Chamber Ensembles) is required. All Students must take four credits of Specialized Ensemble: MUSC 159 (Chamber Strings) or MUSC 305 (Readings in Orchestral Repertoire). Wind students are required to take at least two credits of MUSC 305.

³ Music Elective: MUSC 309 (Instrumentation), MUSC 310 (Orchestration) and MUSC 312 (Instrumental Conducting) are highly recommended as especially appropriate to this Major. Additional credits of ensemble are not permitted for fulfilling the Music Elective requirements.

Major: Organ

A student planning to pursue a career as recitalist, teacher of organ or church organist should enrol in this program.

All students planning to major in organ in the Bachelor of Music program must audition for the Division of Keyboard Instruments just prior to the beginning of classes.

Transfer students from other colleges and universities will audition at the same time. Students will be required to demonstrate a high standard of keyboard proficiency and sufficient background in organ to give evidence of the probability of rapid development. The auditions will determine the admission of students to the performance program and whether they will be allowed to transfer organ credits from other colleges and universities.

Students accepted as organ performance majors will be expected to attain annual levels corresponding approximately to those listed below. In addition to solo repertoire, the areas of sight reading and quick study will be tested.

- *End of First Year* — Bach: Trio Sonata No. 1; Mendelssohn: Sonatas No. 1 or 6; Messiaen: *Le Banquet Celeste*.
- *End of Second Year* — Bach: Dorian Toccata; Franck: Chorales; Duprè: Prelude and Fugue in G minor.
- *End of Third Year* — Bach: Fantasia and Fugue in G minor; Hindemith: Sonatas; Durufle: Suite. Third-year recital.
- *End of Fourth Year* — Bach: Trio Sonatas No. 5 and 6; Reger: Fantasia; Messiaen: *Transports de Joie*. Fourth-year recital.

First Year

Course	Credits	
MUSC 100	2	Theory of Music I
MUSC 101	2	Theory of Music II
MUSC 105	2	Aural Skills I
MUSC 120	3	Music in Society
MUSC 121	3	History of Music I
	3	Large Ensemble ¹
MUSC 171	2	Piano
MUSC 193	6	Music Performance (Organ)
	6	First-year English
	6	Non-Music Electives ²
Total	36	

Second Year

Course	Credits	
MUSC 200	2	Theory of Music III
MUSC 201	2	Theory of Music IV
MUSC 205	2	Aural Skills II
MUSC 220	3	History of Music II
MUSC 221	3	History of Music III
MUSC 293	6	Music Performance (Organ)
MUSC 271	2	Piano
	3	Large Ensemble
	6	Literature Requirement (LIT)
	6	Non-Music Electives ³
Total	35	

Third Year

Course	Credits	
MUSC 300	3	Theory of Music V
MUSC 301	3	Theory of Music VI
MUSC 394	8	Music Performance (Organ Recital)
MUSC 149	2	Keyboard Harmony and Transposition
MUSC 311	4	Conducting
MUSC 352	3	History of Keyboard Music I
MUSC 353	3	History of Keyboard Music II
	6	Religious Studies ³
Total	32	

Fourth Year

Course	Credits	
MUSC 494	8	Music Performance (Organ Recital)
MUSC 253	2	Harpichord Accomp.
	6	Music History Elective
	6	Theory Electives ³
	6	Non-Music Electives ³
Total	28	

¹ *Large Ensemble:* Students will enrol in either MUSC 153 (University Singers) or MUSC 154 (College Choir), with the permission of the School.

² *Religious Studies:* To be elected after consultation with the Department of Religious Studies and School of Music. Students are also advised to take one or more non-credit courses from one of the theological colleges on campus after consultation with the School of Music and the college concerned.

³ Students will choose two courses from MUSC 410-415.

Major: Piano

All students planning to major in piano in the Bachelor of Music program are required to audition for the Keyboard Instruments division just prior to the beginning of classes. Transfer students from other colleges and universities will audition at the same time. The auditions will determine the admission of students to the performance program and whether they will be allowed to transfer piano credits from other universities and colleges.

In general, the entrance level corresponds to the Toronto or Western Board Associateship or its equivalent. However, students must realize that they will be accepted contingent solely on the probability of rapid development during the four-year program. The possession of a diploma of itself is not a guarantee of acceptance.

Students accepted as first-year piano majors will be expected to attain annual levels corresponding approximately to those given below. The works cited are given only as flexible guides to the levels of technical and

musical achievement to be attained and do not indicate specific repertoire requirements. Naturally, it is assumed that artistic and musical achievement will keep pace with technical growth at every stage of the student's development.

- **End of First Year**—Virtuoso études (e.g. Chopin: Op. 10, No. 5); Bach: French Suite No. 3; Beethoven: Sonata Op. 7; Schumann: *Papillons*; Bartok: Bagatelles; Concertos (e.g. Mozart: K. 453).
- **End of Second Year**—Virtuoso études (e.g. Chopin: Op. 25, No. 3); Bach: English Suite No. 4; Beethoven: Sonata, Op. 28; Schubert: Sonata, Op. 122; Ravel: Sonatina; Concertos (e.g. Liszt: No. 1).
- **End of Third Year**—Virtuoso études (e.g. Liszt: Paganini Etudes); Bach: Toccata in C minor; Beethoven: Sonata, Op. 57; Brahms: Scherzo, Op. 4; Stravinsky: Sonata; Concertos (e.g. Rachmaninoff: No. 2); vocal and instrumental accompaniments; piano chamber works. Third-year recital.
- **End of Fourth Year**—Virtuoso études (e.g. Chopin: Op. 10, No. 2); Bach: Chromatic Fantasy and Fugue; Beethoven: Sonata, Op. 110; Schumann: Kreisleriana; Stockhausen: *Klavierstücke*; Concertos (e.g. Brahms: Nos. 1 and 2); vocal and instrumental accompaniments; piano chamber works. Fourth-year recital.

In general, entrance auditions and term examinations for piano majors include sight reading and quick study in addition to the performance of prepared repertoire

First Year

Course	Credits	
MUSC 100	2	Theory of Music I
MUSC 101	2	Theory of Music II
MUSC 105	2	Aural Skills I
MUSC 120	3	Music in Society
MUSC 121	3	History of Music I
MUSC 136	4	Piano Repertoire I
MUSC 193	6	Music Performance (Piano)
	5	Large Ensemble ¹
	6	First-year English
Total	31	

Second Year

Course	Credits	
MUSC 200	2	Theory of Music III
MUSC 201	2	Theory of Music IV
MUSC 205	2	Aural Skills II
MUSC 220	3	History of Music II
MUSC 221	3	History of Music III
MUSC 236	4	Piano Repertoire II
MUSC 293	6	Music Performance (Piano)
	3	Large Ensemble ¹ or
MUSC 161	2	Piano Chamber Ensemble
	6	Literature Requirement (Arts)
	3	Non-Music Elective(s)
Total	33/34	

Third Year

Course	Credits	
MUSC 300	3	Theory of Music V
MUSC 301	3	Theory of Music VI
MUSC 394	8	Music Performance (Piano Recital)
MUSC 149	2	Keyboard Harmony and Transposition
MUSC 249	2	Keyboard Accomp. I
MUSC 161	2	Piano Chamber Ensembles
	3	Music Elective
	9	Non-Music Elective(s)
Total	32	

Fourth Year

Course	Credits	
MUSC 440	2	Piano Teaching Methods and Materials
MUSC 494	8	Music Performance (Piano Recital)
MUSC 349	2	Keyboard Accomp. ²
MUSC 161	2	Piano Chamber Ensembles
	12	Non-Music Elective(s)
	3	Music Electives
Total	29	

¹ *Large Ensemble*: Students may elect any one of MUSC 150 (Large Instrumental Ensemble), MUSC 153 (University Singers) or MUSC 154 (University Choral Union), with the permission of the School.

² Students may substitute MUSC 235 (Accompanying on the Harpsichord I) for MUSC 349.

Major: Voice

Students planning to major in Voice must successfully audition before the Vocal division just prior to the beginning of classes, singing music of their own choice.

- **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 repertoire 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 larger 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 several languages. Ability to perform contemporary English, Canadian and American songs will be expected. A third-year recital is required.
- **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 repertoire for his or her vocal classification. A fourth-year recital is required.

First Year

Course	Credits	
MUSC 100	2	Theory of Music I
MUSC 101	2	Theory of Music II
MUSC 105	2	Aural Skills I
MUSC 120	3	Music in Society
MUSC 121	3	History of Music I
MUSC 193	6	Music Performance (Voice)
MUSC 171	2	Piano ¹
	3	Large Ensemble ²
MUSC 170	2	Lyric Diction
	6	First-year English
Total	31	

Second Year

Course	Credits	
MUSC 200	2	Theory of Music III
MUSC 201	2	Theory of Music IV
MUSC 205	2	Aural Skills II
MUSC 220	3	History of Music II
MUSC 221	3	History of Music III
MUSC 293	6	Music Performance (Voice)
MUSC 271	2	Piano
	3	Large Ensemble
	6	Literature Requirement
	6	Italian ³
Total	35	

Third Year

Course	Credits	
MUSC 300	3	Theory of Music V
MUSC 301	3	Theory of Music VI
MUSC 394	8	Music Performance (Voice Recital)
MUSC 365	2	Song Repertoire I
	3	Large Ensemble

	6	German ⁴
	6	Non-Music Elective(s)
Total	31	

Fourth Year

Course	Credits	
MUSC 493	8	Music Performance (Voice Recital)
MUSC 465	2	Song Repertoire II
MUSC 442	4	Song Interpretation & Accompaniment
	3	Large Ensemble
	2	Small Ensemble ⁴
	6	Music Elective ⁵
	6	French ⁵
Total	31	

¹ The secondary instrument will be piano except where a student elects another instrument after having met in full the Minimum Achievements in Piano for second year described above. Secondary piano students will be auditioned. Those judged to have insufficient background to require private study will be placed initially in MUSC 141 (class), and will, in second year, take either MUSC 241 (class) or MUSC 271 (private) as determined by the level of achievement in 141.

² *Large Ensemble*: Students will enrol in either MUSC 153 (University Singers) or MUSC 154 (University Choral Union).

³ *Languages other than English*: In certain cases students may concentrate on one or two of the languages required, and the indicated sequence may be altered.

⁴ *Small Ensemble*: Students will elect either MUSC 155 (Chamber Singers) or MUSC 157 (Vocal Collegium Musicum Ensemble).

⁵ MUSC 441 (Vocal Techniques) or MUSC 311 (Choral Conducting) are highly recommended electives.

The Bachelor of Arts Degree in Music

The B.A. in Music is designed for students interested in studying music as one of the liberal arts. It can also lead successfully to graduate work in music theory, music history, or ethnomusicology. For a description of the B.A. Major and Honours programs in Music, see the **Faculty of Arts** section.

Courses for Students Majoring in Other Fields

The School offers a number of courses intended for students with little or no formal background in music. A selection from among these is offered each year. Included are:

Courses not creditable toward the B.Mus. or the B.A. in Music

MUSC 106	3/6	Introduction to Music Composition
MUSC 225	3	Masterworks of Western Music
MUSC 321	3/6	Music Appreciation, Twentieth Century
MUSC 324	3	Music and Civilization I
MUSC 325	3	Music and Civilization II
MUSC 326	3/6	Music Appreciation

Courses creditable toward the B.A. in Music but not the B.Mus.

MUSC 103	3	Introduction to the Theory of Music
MUSC 104	3	Introduction to Diatonic Harmony
MUSC 203	3	Melody, Counterpoint and Harmony
MUSC 204	3	Introduction to Chromatic Harmony and 20th-Century Techniques

Courses creditable to both the B.Mus. and the B.A. in Music

MUSC 328	3	World Music Cultures
MUSC 345	3	Aesthetics and Practice of Film Music

Academic Staff

Director

ROBERT SILVERMAN, B.A. (Sir G. Wms.), B.Mus. (McG.), M.Mus., Artist Diploma, D.M.A. (Eastman).

Professors

WILLIAM E. BENJAMIN, B. Mus. (McG.), M.F.A., Ph.D. (Princ.).
 MARTIN C. BERINBAUM, B.S. in Trumpet and Music Ed. (S. Calif.), M.S. in Trumpet (Juilliard).
 GREGORY G. BUTLER, B.Mus. (McG.), M.A., Ph.D. (Tor.).
 STEPHEN G. CHATMAN, B.Mus. (Oberlin), M.M., D.M.A. (Mich.).
 JANE A. COOP, B.Mus. (Tor.), M.Mus. (Peabody).
 ANDREW A. DAWES, Diploma (Conservatoire de Genève).
 JAMES L. FANKHAUSER, B.Mus. (Oberlin), M.A. (Calif., Berkeley).
 JESSE READ, B.Mus. (Jacksonville), M.Mus. (Vic.B.C.).
 ROBERT ROGERS, B.A. (Brit. Col.), M.A. (Wash.).
 GERALD STANICK.
 FRENCH A. TICKNER, B.Mus., M.Mus. (S. Calif.).

Associate Professors

KEITH HAMEL, B.Mus. (Queen's), A.M., Ph.D. (Harv.).
 J. EVAN KREIDER, B.A. (Goshen), M.Mus., Ph.D. (Indiana).
 JOHN B. ROEDER, B.A. (Harv.), Ph.D. (Yale).
 JOHN E. SAWYER, B.A., B.Mus. (Brit. Col.), M.Mus. (Ill.), Ph.D. (Tor.).
 JAMES R. SCHELL, B.A., B.M. (North Texas), M.Mus. (Yale).
 RENA SHARON, B.Mus., M.Mus. (Indiana).
 ALAN THRASHER, A.A. (Valley Forge), B.S. (Mansfield State), M.M. (Ithaca), Ph.D. (Wesleyan).
 ERIC J. WILSON, B.Mus., M.Mus. (Juilliard).
 EUGENE N. WILSON, B.Mus. (S. Calif.), M.A., Ph.D. (Wash.).

Assistant Professors

RICHARD KURTH, B.Sc. (Tor.), M.Mus. (Hartt), Ph.D. (Harv.).
 VERA MICZNIK, Diploma (Bucharest Conservatory), M.A. (Virginia), Ph.D. (N.Y. State, Stony Brook).

Adjunct Professors

GORDON CHERRY, B.Mus. (Eastman) — Trombone.
 CAMILLE CHURCHFIELD, B.A. (Redlands) — Flute.
 ROGER COLE, B. Mus. (Juilliard) — Oboe.
 J. WESLEY FOSTER — Clarinet.
 KENNETH J. FRIEDMAN, B.Mus. (S. Calif.), M.S. (Juilliard) — Double Bass.
 MARTIN HACKLEMAN — French Horn.
 KUM SING LEE, Diploma (Hochschule für Musik, Berlin), M.Mus. (Rosary College, Villa Schifanoia, Florence), L.R.S.M., L.Mus. A. (Australia) — Piano.
 JULIA NOLAN, B.Mus. (Brit. Col.), M.Mus. (Indiana) — Saxophone.
 JOHN RUDOLPH, M.Mus. (Catholic Univ.) — Percussion.
 KATHLEEN RUDOLPH, B.M., M.M., D.M.A. (Catholic Univ.) — Flute.
 DOUGLAS SPARKES, B.Mus. (Tor.) — Trombone.
 FREDERICK STRIDE, B.Mus. (Brit. Col.) — Stage Band, Jazz.
 MICHAEL STRUTT — Guitar.

Part-time Lecturers

JEREMY BERKMAN, B.A., B.Mus. (Oberlin), M.Mus. (Juilliard) — Trombone.
 DAVID A. BRANTER, M.M. (Indiana) — Saxophone.
 PETER BERRING, B.Mus. (Brit. Col.) — Composition, Film Music.
 ADELE CLARK, B.Mus., M.Mus. (Brit. Col.) — Voice.
 RITA COSTANZI, B.Mus., Performers Certificate (Eastman) — Harp.
 GREGORY COX, B.Mus. (Eastman) — Trombone.
 TERENCE DAWSON, B.Mus. (Mt. Allison), M.Mus., D.M.A. (Brit. Col.) — Piano.
 JERRY L. DOMER, M.Mus. (Boston) — Oboe.
 BRUCE DUNN — Conducting.
 MORNA EDMUNDSON, B.Mus. (Brit. Col.) — Vocal Collegium.
 ALICE ENNS, A.R.C.T., B.Mus. (Manit.), B.A. (Sask.) — Piano.

RICHARD EPP, B.Mus. (Manit.), M.Mus. (S. Calif.) — Opera, voice accompanist.
 MARISA GAETANNE, M.Mus. (Brit. Col.) — Voice.
 BRIAN G'FROERER, B.Mus. (Brit. Col.) — French Horn.
 PETER GAL, B.Sc. (McG.) — Class Woodwinds.
 PETER HANNAN, B.Mus. (Brit. Col.) — Recorder.
 ROBERT C. JORDAN — Guitar.
 DIANE LEWARNE, B.A. (Western Ontario) — Voice.
 JAMES LITTLEFORD, B.Mus. (Brit. Col.) — Class Brass.
 DIANE LOOMER, B.A. (Gustavus Adolphus), B.Mus. (Brit. Col.) — Choral Union.
 DAVID McCOY, B.Mus., M.Mus. (Brit. Col.) — Piano.
 JANE KAY MARTIN, B.Mus. (Cleveland Institute of Music), M.M. (Oregon) — Flute.
 ALAN MATHESON, B.Mus. (Northwestern) — Trumpet.
 RICHARD MINGUS, B.Mus. Ed. (Oberlin), M.Mus. (Ohio) — French Horn.
 DAVID MEEK, B.Mus. (Brit. Col.) — Voice.
 KENNETH W. MOORE — Percussion.
 EDWARD NORMAN, B.M. (Brit. Col.) — Organ.
 DOREEN A. OKE, B.Mus. (Brit. Col.) — Harpsichord.
 BETH ORSON, B.Mus. (Oberlin) — Oboe.
 GENE RAMSBOTTOM — Clarinet.
 ALAN RINEHART, Associate in Arts (Southwestern Michigan) — Guitar.
 EUGENE SKOVORODNIKOV, B.Mus. (Voroshi lovgrad), M.A. (Kharkov), D.M.A. (Leningrad) — Piano.
 ELIZABETH VOLPE, B.Mus. (Tor.) — Harp.
 MICHAEL WALL, B. Mus. (Houston) — French Horn.
 ELLIS WEAN — Tuba.
 MIRANDA WILKINS, A.R.C.T., B.Mus. (Vic.B.C.), M.Mus. (Johns H.) — Piano.

1995-96

Philosophy

The faculty of the School of Nursing believe that the unique function of nursing is to nurture individuals during critical periods of the life cycle so that they may develop and utilize a range of coping behaviors which permit them to satisfy their basic human needs and thereby move toward optimal health. The nurse makes this unique contribution as a member of the team of health professions whose ultimate goal is the optimal health of humankind.

The faculty have set forth more explicit statements of beliefs about nursing, preparation for nursing, students, faculty, expansion and dissemination of nursing knowledge and leadership. These are available to all applicants to the School and upon request.

Objectives of the Baccalaureate program which follow set forth the specific qualifications graduates are expected to possess and the professional roles they are prepared to fill.

Baccalaureate Program

For secondary school graduates without registered nurse preparation, the B.S.N. program is four years in length. This program is a joint offering of the School of Nursing and Vancouver Hospital and Health Sciences Centre.

Registered nurses who have completed a diploma nursing program in a hospital school of nursing or community college may apply for admission to the baccalaureate program. If eligible for admission to the University and the B.S.N. program, these candidates are admitted to the third year of the program.

Students who complete the baccalaureate program and earn the B.S.N. degree are prepared to provide nursing care to both individuals and families, to people of all ages, in any stage of health or illness, working interdependently with other health professionals in primary care settings as well as in acute and long-term settings.

Objectives

Students who complete the baccalaureate program and earn the B.S.N. degree are prepared to provide nursing care to clients (individuals of all ages, families and other groups) in primary care settings as well as acute and long-term settings. In these settings, graduates are expected to:

- 1) use the nursing process within a conceptual framework for nursing,
- 2) relate therapeutically with clients,
- 3) perform nursing techniques with the degree of skill that ensures the client's comfort and safety,
- 4) apply principles of learning and teaching in the provision of nursing care,
- 5) use research findings in the provision of nursing care,
- 6) demonstrate clinical judgment in nursing practice,
- 7) be responsible and accountable in the professional practice of nursing,
- 8) apply management principles in nursing practice,
- 9) demonstrate the ability to assume a leadership role with clients and colleagues,
- 10) work collaboratively with members of the health care team in the provision of health care,
- 11) respond appropriately to changes in the health care field,
- 12) be committed to enhancing the stature of the nursing profession.

The School of Nursing

A School within the Faculty of Applied Science.

The School of Nursing offers Baccalaureate, Master's and Doctoral programs.

In the Baccalaureate Program, secondary school graduates can follow a four-year program leading to the degree of Bachelor of Science in Nursing (B.S.N.). This program is a joint offering of the School of Nursing and Vancouver Hospital and Health Sciences Centre. Registered nurses can take a two-year program leading to the degree of Bachelor of Science in Nursing (B.S.N.).

Baccalaureate graduates are offered a two-year program leading to the degree of Master of Science in Nursing (M.S.N.).

For Master's graduates, a three-year program leading to the degree of Doctor of Philosophy in Nursing (Ph.D.) is offered.

Admission

All inquiries relating to admission to the School of Nursing should be addressed to: The University of British Columbia, Registrar's Office, Room 2016, Brock Hall, 1874 East Mall, Vancouver, B.C., V6T 1Z1. Requests for application forms should specify the particular program in which the applicant is interested.

Additional information for registered nurses may be obtained from the School of Nursing, T-206-2211 Wesbrook Mall, Vancouver, B.C. V6T 2B5.

The last day for submission of applications for admission to the four-year B.S.N. program for the Winter Session beginning the following September is April 30, with necessary documents and official transcripts to be in the Registrar's Office by June 30.

The last day for submission of applications for admission to the baccalaureate program for registered nurses is February 1.

Within two weeks of notification of acceptance by the University the successful applicant for the B.S.N. program is required to submit to the School of Nursing a deposit of \$100 (by cheque payable to the University of British Columbia). This deposit will be applied toward tuition fees. If the applicant does not register the deposit will be forfeited.

The School of Nursing has a limited enrolment. Since the number of qualified applicants usually exceeds the number of places available, fulfilment of the following requirements is not a guarantee of admission. The faculty reserves the right of selection of all students for admission and readmission to the School. An interview may be arranged if counselling is desired.

Applicants whose first language is not English must demonstrate competence in both oral and written English. Prior to being admitted to the School, applicants may be asked to enrol in a special program to remedy problems identified with English usage.

Admission to the First Year of the Four-Year B.S.N. Program

- Secondary School Applicants — Applicants must meet the general admission requirements of the University

which are British Columbia Senior Secondary School graduation or the equivalent with a 'C+' average (2.5 on a 4-point scale). British Columbia secondary school graduation must include the following courses:

Biology 11	French 11 ¹
Biology 12	French 12 ²
Chemistry 11	Mathematics 11
Chemistry 12	Physics 11
English 11	Social Studies 11
English 12	

¹ or other language 11, required but not included in GPA calculation.

² or any academic Grade 12 subject.

Eleven subjects required, GPA calculated on 10 subjects. Out-of-province applicants must present equivalent Science courses.

- Applicants from Post-Secondary Institutions — To be considered for admission, applicants are required to have a minimum academic standing of 'C+' (2.5 on a 4-point scale). Applicants who have completed college and/or university courses and are deficient in Physics 11 or Chemistry 12 should consult an adviser in the School of Nursing. The University will consider granting transfer credit for all appropriate post-secondary (college and university) courses completed although the length of time to complete the program will still be four years. The University will not grant a degree for studies that represent less than the equivalent of two regular winter sessions (60 credits).

Admission to the Third Year of the Four-Year B.S.N. Program for Registered Nurses

No specific courses at the secondary school level are mandatory for registered nurse applicants. Normally, admission to the School of Nursing requires a minimum academic standing of 'C+' average (2.5 on a 4-point scale) based on either Senior Secondary School graduation or at least 12 credits of university transfer course work, whichever is most recent.

Applicants applying as registered nurses must have current practising British Columbia registration or be eligible to so register. Applicants are required to provide evidence of ability to perform to the level of competence expected of a new graduate as congruent with R.N.A.B.C. guidelines.

Acceptable evidence includes one of the following:

- 1) Two (2) satisfactory references from employers for whom they have worked within the three years preceding application for admission.
- 2) Satisfactory completion of an R.N.A.B.C.-approved refresher course within three years prior to admission. Satisfactory references are required from a refresher course instructor; a supervisory person in a nursing unit in which the applicant has had clinical experience during or subsequent to the refresher course.
- 3) Graduation from an approved School of Nursing within the last three years; work experience is not required.

A maximum of 30 credits of course work completed at other institutions may be transferred provided such work meets all the requirements of the University and the School of Nursing. A maximum of six credits may be granted for post-basic continuing education courses in nursing completed in an educational institution. Requests for such credits will be considered on an individual basis. All B.S.N. degree requirements must be met within a maximum of six years of initial enrolment in one or more nursing courses except NURS 126.

Re-admission

The School reserves the right to readmit students and to stipulate conditions attached to readmission. Readmission to the School may necessitate repetition of nursing courses previously completed if, in the judgment of faculty, curriculum changes and/or length of interruption are sufficient to render the applicant inadequately prepared for the subsequent year. Therefore, students are strongly advised to notify the School of Nursing by February of their intentions to enrol in the clinical nursing course in order that suitable time is available to complete the make-up work. Students may request the option of demonstrating competence in the areas of change as an alternative to completing a make-up experience. Where required preparation is unavailable due to cost or other factors, applicants will be refused admission beyond first-year level, but may be considered for readmission to first year. Students entering the four-year B.S.N. degree program must meet all requirements within a minimum of four and a maximum of seven years from initial enrolment. Students interrupting their program anytime after completion of the first academic year are advised that curriculum changes may necessitate a period of supplementary work to enable them to fit into the subsequent courses.

Where time normally permitted for completion of degree has lapsed, candidates will be required to provide evidence to justify special consideration.

Advancement and Supplemental Examinations

The minimum passing grade in each nursing course is 60%. The minimum overall grade average for promotion from one year to the next is 65%.

In clinical nursing courses the student is required to have successfully completed clinical practice before being allowed to write the final examination.

Supplemental examinations may be available provided that:

- 1) the student's attendance in the class has been satisfactory, and all required course work has been completed;
- 2) the student has written the final examination and obtained at least 50% if a nursing course or at least 40% if a non-nursing course;

- 3) the student has achieved an average of at least 60% in the work of the session including the failed course(s).

Note: Full-time study is defined as the full set of required courses of any year of the B.S.N. degree program except for those students with advance credit in which case 24 credits is the minimum full-time course load.

A student in any session will be assigned fail standing for the session where a study program of more than 12 credits has been taken with satisfactory standing in less than 60% of it.

A student assigned fail standing will normally be required to discontinue study in the School of Nursing for at least one year.

Students admitted as registered nurses must maintain current practising British Columbia registration and provide evidence of it upon request in order to continue in the program.

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 reserve the right to require a student to withdraw from the School if considered to be unsuited to proceed with the study or practice of nursing.

Students completing the baccalaureate program will be granted "Honours" standing if an average of a minimum of 80% is achieved in the third and fourth years of the program with no failed courses.

English Requirements

To qualify for the degree of B.S.N. students must complete English 112 and one other three-credit first-year English course. Satisfactory completion of the Language Proficiency Index (LPI) examination is prerequisite to all first year English courses at UBC. (See *Calendar* index under "Language Proficiency Index".)

Requirements for Nurse Registration

Students who successfully complete the four-year B.S.N. program and who are recommended by the Director of the School of Nursing to the Registered Nurses' Association of British Columbia will be eligible to write the nurse registration examination and to apply for nurse registration in B.C. on passing the examination.

Information relative to other requirements for registration may be obtained from the Registered Nurses' Association of British Columbia, 2855 Arbutus Street, Vancouver, B.C. V6J 3Y8. Applicants who have reason to believe they may not be eligible for registration should consult the professional association before beginning studies.

Costs Other Than Sessional Fee

There are additional expenses for uniforms, travel and clinical practice. Students should be prepared to have clinical practice outside the Vancouver area and therefore should include travel costs for this experience in estimating total expenses. Students are encouraged to try to have access to a car for transportation to minimize time and effort expended in travel to the varied areas used for clinical experiences.

The School will provide applicants with information regarding these additional costs.

Awards and Financial Assistance

A supplement to the *Calendar* entitled *Awards and Financial Aid* contains a list of current academic awards (scholarships, prizes, etc.) and available financial assistance (grants, bursaries and loans). Students are encouraged to consult the supplement to determine awards for

which they may be eligible. Students are advised to refer to the supplement for interpretation of "full-time" study as it relates to eligibility for scholarships and other forms of financial assistance. For further information and application forms contact The University of British Columbia, University Awards Committee, Room 1036, Brock Hall, 1871 East Mall, Vancouver, B.C. V6T 1Z1.

The following awards are not administered by the University Awards Committee:

- **Registered Nurses Foundation** — A number of bursaries are offered through the Foundation. Information is available from the Registered Nurses' Foundation of B.C., 2855 Arbutus Street, Vancouver, B.C. V6J 3Y8.
- **Victorian Order of Nurses for Canada** — Bursaries available to students in the final year of B.S.N. program. Information and application forms may be obtained from: The National Director, Victorian Order of Nurses for Canada, 5 Blackburn Avenue, Ottawa, Ontario K1N 8A2.
- **Heart and Stroke Foundation of Canada** — Nursing research fellowship for graduate students undertaking study in some area of cardiovascular or stroke research. Information available from: Heart and Stroke Foundation of Canada, 200 - 160 George St., Ottawa, Ontario, K1N 9M2.
- **Local R.N.A.B.C. Districts and Chapters** — Many Chapters and other local organizations offer bursaries and/or loans to students from their area. Information can be obtained from Director, UBC School of Nursing or Registered Nurses Association of B.C.
- **C.N.A. Loan Fund** — Information and application forms may be obtained from the Canadian Nurses Association, 50 The Driveway, Ottawa, Ontario, K2P 1E2.
- **Canadian Nurses Foundation Awards** — Members of the Canadian Nurses Association may apply for awards and fellowships valued at \$4,500 to \$6,000 for study at the doctoral level, \$3,000 for study at the Master's level and \$1,500 for study at the baccalaureate level in nursing. Application forms may be obtained from C.N.F. after November 1 and must be submitted by April 30. Information and/or application forms available from The Canadian Nurses Foundation, 50 The Driveway, Ottawa, Ontario, K2P 1E2.

Alumnae Associations

Many School of Nursing Alumnae Associations offer bursaries and/or loans to their members. Information about these would be obtainable from the Director of the School from which you have graduated.

The Four-Year Program

Students will be required to show proof of annual completion of the St. John Ambulance Association basic life support course, "Basic Rescuer", Level C, or the equivalent thereof at the beginning of each academic year. The clinical courses in one year must be completed prior to enrolment in the clinical courses in the following year. The clinical courses are NURS 130, 131, 230, 231, 333, 334, 302, 303, 335, 432, 410, 411, 412, 443, 444, 408, 409.

First Year

Course	Credits	
NURS 105	2	Professional Nursing in Contemporary Society I
NURS 130	3	Introduction to Nursing Care I
NURS 131	4	Introduction to Nursing Care II
BIOL 153	6	Human Biology
PSYC 100	6	Introductory Psychology
ENGL 112	3	Strategies for University Writing

ENGL XXX	3	One of: ENGL 110, 111, 120, 121
MICB 153	3	Applied Microbiology
Total	30	

Second Year

Course	Credits	
NURS 202	4	Core Concepts in Nursing
NURS 230	6	Nursing Care of Adults
NURS 231	6	Nursing Care of Older Adults
PHAR 240	3	Pharmacology for Nurses
PATH 375	2	Introduction to Human Pathology
HUN1 209	3	Nutrition
	6	Elective(s): Social or Behavioural Science ¹
Total	30	

Note: Students are required to complete the St. John Ambulance Association basic life support course, "Basic Rescuer", Level C, or the equivalent thereof before entering Second Year and to show proof of annual completion at the beginning of each academic year.

Third Year

Course	Credits	
NURS 333	6	Nursing Care of Children ¹
NURS 334	6	Nursing Care of Individuals in the Childbearing Cycle ¹
NURS 303	4	Family and Community Nursing
NURS 304	3	Introduction to Nursing Research
NURS 305	2	Professional Nursing in Contemporary Society II
STAT 203	3	Statistical Methods I
	6	Elective(s): 300/400 level
Total	30	

Fourth Year

Course	Credits	
NURS 405	2	Issues in Professional Nursing
NURS 406	3	Management in Nursing Practice
NURS 426	3	Nursing and the Health of Communities
NURS 432	6	Nursing Care of Adults and Families with Mental Health Concerns I ¹
	6	One course only from NURS 440-444
	6	NURS 408 or 409 or HCET 400 may be selected for elective credit
NURS 445	0	Extended Practicum in Professional Nursing
	12	Electives: 300/400 level
Total	32	

The Two-Year Program for Registered Nurses**Third Year**

Course	Credits	
NURS 302	6	The Process of Nursing I ²
NURS 303	4	Family and Community Nursing
NURS 304	3	Introduction to Nursing Research
NURS 305	2	Professional Nursing in Contemporary Society II
NURS 335	6	The Process of Nursing II ²
STAT 203	3	Statistical Methods I
	6	Elective(s): 300/400 level
Total	30	

Note: Registered nurse students are expected to complete the St. John Ambulance Association basic life support course, "Basic Rescuer", Level C, or the equivalent thereof before entering Third Year.

Fourth Year

Course	Credits	
NURS 405	2	Issues in Professional Nursing
NURS 406	3	Management in Nursing Practice
NURS 426	3	Nursing and the Health of Communities
	12	Two courses from NURS 440-444
	6	NURS 408 or 409 or HCET 400 may be selected for elective credit
NURS 445	0	Extended Practicum in Professional Nursing (optional)
	12	Electives: 300/400 level
Total	32	

¹ Electives may be selected from any of the courses offered in the University subject to prerequisites and approval of the School of Nursing.

In selecting electives students are advised to consider:

- purposes to be served by the electives in the student's total program, i.e. selecting courses in one content area for depth of knowledge vs. selecting courses in several content areas for breadth of knowledge.
- necessary prerequisites for desired upper level courses.
- career goals, e.g. graduate study, nature of employment.
- acceptability of certain electives because of duplication of content included in nursing courses.

Students who wish counselling should seek it well in advance of registration week by arranging an appointment with the year coordinator or designated academic adviser.

² Registered Nurse students only

³ Basic students only

Graduate Studies

For details of the M.S.N. and Ph.D. programs in Nursing, see the Faculty of Graduate Studies section of the *Calendar* or write to: The Graduate Adviser, The University of British Columbia School of Nursing, T206-2211 Wesbrook Mall, Vancouver, B.C., V6T 2B5.

Academic Staff

- KATHARYN A. MAY, B.S.N. (Duke), M.S., D.N.Sc. (Calif., San Francisco), R.N., F.A.A.N., Professor and Director.
- JOAN M. ANDERSON, B.N. (McG.), M.S.N., Ph.D. (Brit. Col.), R.N., Professor.
- ELIZABETH M. DAVIES, B.Sc.N. (Alta.), M.S.N., M.S. (Arizona), Ph.D. (Wash.), R.N., Professor.
- SONIA ACORN, B.N. (McG.), M.Sc.(A) (Boston), Ph.D. (Utah), R.N., Associate Professor.
- JOAN L. BOTTORFF, B.Sc.N. (Alta.), B.Ed., M.Ed. (Sask.), M.N., Ph.D. (Alta.), R.N., Associate Professor.
- ELAINE A. CARTY, B.N. (New Br.), M.S.N. (Yale), R.N., Associate Professor.
- DONELDA J. ELLIS, B.Sc.N. (W.Ont.), M.S.N. (Brit. Col.), R.N., Associate Professor.
- CLARISSA P. GREEN, B.S.N. (Florida), M.S.N. (Calif., Los Angeles), R.N., Associate Professor.
- ANGELA HENDERSON, B.S.N., M.S.N. (Brit. Col.), R.N., Associate Professor.
- BARBARA ANN HILTON, B.S.N. (Brit. Col.), M.Sc.N. (Tor.), Ph.D. (Texas), R.N., Associate Professor.
- CAROL JILLINGS, B.S. (San Francisco), M.S.N. (Brit. Col.), Ph.D. (Union), R.N., Associate Professor.
- GLORIA JOACHIM, B.S.N. (Maryland), M.S.N. (Brit. Col.), R.N., Associate Professor.
- LINDA G. LEONARD, B.S.N., M.S.N. (Brit. Col.), R.N., Associate Professor.
- M. JUDITH LYNAM, B.Sc.(N) (McG.), M.S.N. (Brit. Col.), R.N., Associate Professor.
- CAROLE A. ROBINSON, B.Sc., B.Sc.N. (Alta.), M.S.N. (Brit. Col.), Ph.D. (Calg.), R.N., Associate Professor.
- SALLY E. THORNE, B.S.N., M.S.N. (Brit. Col.), Ph.D. (Union), R.N., Associate Professor.
- M. ANNE WYNESS, B.S.N. (Brit. Col.), M.N. (Wash.), R.N., CNN(C), Associate Professor.
- CONNIE CANAM, B.N. (Dal.), M.S.N. (Brit. Col.), R.N., Assistant Professor.
- MARILYN E. DEWIS, B.Sc.N. (Tor.), M.Ed. (Ont.), R.N., Assistant Professor.
- JANET ERICKSEN, B.S.N. (Ill.), M.A. (N.Y.), R.N., Assistant Professor.
- JANET M. GORMICK, B.S. (Syr.), M.N. (Calif., Los Angeles), R.N., Assistant Professor.
- WENDY HALL, B.N. (Manit.), M.S.N. (Brit. Col.), R.N., Assistant Professor.
- VIRGINIA E. HAYES, B.Sc.N. (Windsor), M.N. (Dal.), Ph.D. (Calif., San Francisco), R.N., Assistant Professor.
- ROBERTA J. HEWAT, B.S.N., M.S.N. (Brit. Col.), R.N., Assistant Professor.
- ANNA MARIE HUGHES, B.S.N., M.S.N. (Colorado), Ed.D. (Northern Colorado), R.N., Assistant Professor.
- JOY L. JOHNSON, B.S.N. (Brit. Col.), M.N., Ph.D. (Alta.), R.N., Assistant Professor.
- BARBARA L. PATERSON, B.N., M.Ed., Ph.D. (Manit.), R.N., Assistant Professor.
- JO ANN PERRY, B.S. (Adelphi, N.Y.), M.S.N. (Brit. Col.), R.N., Assistant Professor.
- JANE ALISON RICE, B.S.N. (Brit. Col.), M.S. (Calif., San Francisco), R.N., Assistant Professor.
- RAYMOND M. THOMPSON, B.Sc.N., M.Sc.N. (W.Ont.), R.N., Assistant Professor.
- MARY V. REGISTER, B.S., M.P.H. (Col.), R.N., Senior Instructor.
- JOANNE RICCI, B.S.N., M.S.N. (Brit. Col.), R.N., Senior Instructor.
- LOUISE TENN, B.Sc.N. (Ont.), M.Ed. (Montr.), R.N., Senior Instructor.
- LYNDA ANDERSON, B.Admin. (Health Services) (Northland Open University), B.S.N. (Vic.B.C.), M.S.N. (Brit. Col.), R.N., Sessional Lecturer.
- MARY JANE DUKE, B.Sc.(N) (McG.), M.S.N. (Brit. Col.), R.N., Sessional Lecturer.
- LYNNE ENSON, B.S.N. (Vic.B.C.), R.N., Clinical Assistant.
- CHARMAINE LEPP, B.N. (Dal.), R.N., Clinical Assistant.
- JUDITH MacDONALD, B.N. (McG.), M.S.N. (Brit. Col.), R.N., Sessional Lecturer.
- FLORENCE MANN, B.S.N. (Sask.), R.N., Sessional Lecturer.

VH Faculty - UBC/VH Nursing Program**Adjunct Professors**

- GAIL BISHOP, B.S.N., M.S.N. (Brit. Col.), R.N.
- FERESHTEH GRENIER, B.S.N. (Pahkavi, Iran), M.Sc.N. (Penn.), R.N.

Clinical Assistant Professor

- MARION CLAUSON, B.S.N., M.S.N. (Brit. Col.), R.N.

Clinical Instructors

- WENDY ARMSTRONG, B.S.N. (Brit. Col.), R.N.
- SYLVIA BARTON, B.S.N. (Brit. Col.), M.Sc.(N), Portland, R.N.
- SUSAN BLAIR, B.S.N., M.S.N. (Brit. Col.), R.N.
- JANICE BROWN, B.N. (Manit.), R.N.
- KATHLEEN DOWNES, B.S.N. (Brit. Col.), R.N.
- CATHERINE ERBEHOJ, B.S.N. (Brit. Col.), R.N.
- BARBARA EDDY, B.S.N. (Brit. Col.), R.N.
- VIOLET ETTLES, B.S.N., M.S.N. (Brit. Col.), R.N.

- CAROL GREGORY, B.S.N. (Brit. Col.), R.N.
SHIRLEY HOLZMAN, B.A., B.S.N. (Sask.), M.Ed., (Brit. Col.), R.N.
JINDA KERRAY, B.S.N. (Brit. Col.), M.S.N. (Brit. Col.), R.N.
GRACE LIM, B.S.N. (Brit. Col.), R.N.
HELGA MARSHALL, B.Sc.N. (Tor.), M.S.N. (Brit. Col.), R.N.
KAREN MAY, B.Sc.N. (Tor.), R.N.
LORI MILLER, B.S.N., M.S.N. (Brit. Col.), R.N.
KIM MUNICH, B.S.N. (Brit. Col.), M.N. (Dal.), R.N.
MARJORIE NELSON, B.A. (Biola), M.A. (Pepperdine), R.N.
LESLEY NICHOLSON, B.S.N. (Brit. Col.), R.N.
SHIRLEY PIDWERTSKY, B.S.N. (Sask.), R.N.
FRANCES ROBERTS, B.S.N. (Brit. Col.), R.N.
NANCY RUSHTON, B.Sc.N. (Alta.), M.S.N. (Brit. Col.), R.N.
SHARON SUNDBERG, B.S.N., M.S.N. (Brit. Col.), R.N.
DONNA TRASOLINI, B.S.N. (Brit. Col.), R.N.
DEBRA TRIVETT, B.N. (Lethbridge), R.N.
BEVERLEY VALKENIER, B.Sc.N. (Tor.), R.N.
KAREN WHITMORE, B.S.N., M.Ed., (Brit. Col.), R.N.
- Adjunct Professors**
CAROL ACTON, B.S.N., M.S.N. (Brit. Col.), R.N., Vancouver Hospital and Health Sciences Centre.
MATHILDA BARA, B.N. (Dal.), M.S.N., M.Ed. (Brit. Col.), R.N., Director, Corporate Education, Vancouver Hospital and Health Sciences Centre.
ELAINE BAXTER, B.Sc.N. (Alta.), M.S.N. (Brit. Col.), R.N., Director of Nursing (Medical/Surgical), Surrey Memorial Hospital.
FRANCE BOUTHILLETTE, B.S. (Montr.), M.S.N. (Indiana), R.N., Nurse Researcher, St. Paul's Hospital.
CHRISTINE F. BRADLEY, B.A., M.S. (McG.), Ph.D. (Brit. Col.), Director of Research and Evaluation in Nursing, Vancouver Hospital and Health Sciences Centre.
JENISE BROUSE, B.S.N., M.S.N. (Brit. Col.), R.N., Director of Nursing, Long Term/Maternal Child Care, Burnaby Hospital.
CLAIRE BUDGEN, B.N. (Wash.), M.S.N. (Calif., San Francisco), Ph.D. (Texas), R.N., College Professor, B.S.N. Program, Okanagan University College.
BARBARA E. BURKE, B.N., M.Sc.(A) (McG.), R.N., Vice President, Patient Services, St. Paul's Hospital.
HEATHER F. CLARKE, B.H.Sc. (Queen's), M.N., Ph.D. (Wash.), R.N., Nursing Research Consultant, Registered Nurses' Association of British Columbia.
MARDLYN J. CRAWFORD, B.N., M.N. (Calg.), R.N., Vice President, Drake Beam Morin.
MICHELE DESCHAMPS, B.Sc.N. (Montr.), M.Sc. (A) (McG.), Ph.D. (Montr.), R.N., Head, Research and Nursing Systems, Division of Nursing, B.C. Cancer Agency.
JANE ELLIS, B.S.N. (Alta.), M.Sc.N. (W. Ont.), R.N., Nursing Policy Consultant, Registered Nurses Association of British Columbia.
IRENE L. GOLDSTONE, B.N. (McG.), M.Sc. (Brit. Col.), R.N., Director, Professional Education and Care Evaluation, B.C. Centre for Excellence in HIV/AIDS.
SHARON GENDRY, B.Sc.N. (W. Ont.), M.B.A. (Tor.), R.N., Vice President, Patient Care Services, Riverview Hospital.
SHIRLEY HALLIDAY, B.N. (Dal.), M.S.N. (Brit. Col.), R.N., Head Nurse, Spinal Cord Injury Program, British Columbia Rehabilitation Society.
PHYLLIS HUNT, B.N. (Dal.), M.S.N. (Brit. Col.), R.N., Director of Nursing, Holy Family Hospital.
CAROL M.B. MITCHELL, B.N. (Manit.), M.S.N. (Brit. Col.), R.N., Director, Patient Services, MSA Hospital.
ANITA MOIZAHN, B.Sc.N., M.N., Ph.D. (Alta.), R.N., Director, School of Nursing, University of Victoria.
T. ROSE MURAKAMI, B.S.N. (Brit. Col.), M.Sc. (A) (McG.), M.S. (Rehab. Nsg.) (Boston), R.N.
TESS ORLANDO, B.S.N., M.S.N. (Brit. Col.), R.N., Director/Clinical Nurse Specialist, Patient Services, Vancouver Hospital and Health Sciences Centre.
- MARY FERGUSON-PARE, B.Sc.N. (Tor.), MPH/HSA (Minnesota), R.N., Vice President, Patient Services, Vancouver Hospital and Health Sciences Centre.
INGE SCHAMBORZKI, B.N., M.Sc.(A), D.Ed. (McG.), R.N.
ANNE SUTHERLAND BOAL, B.A. (Brock), M.H.S.A. (Alta.), R.N., Vice President, Nursing and Treatment Services, B.C.'s Children's Hospital.
JUDITH TOMPKINS, B.N., M.N. (Calg.), R.N., Director/Clinical Nurse Specialist, Patient Services, Vancouver Hospital and Health Sciences Centre.
DALE WALKER, B.S.N. (Brit. Col.), M.Sc.(N) (Portland), R.N., Nursing, Vancouver Health Department.
JANET WALKER, B.S.N., M.S.N. (Brit. Col.), R.N., Manager, Bone Marrow Transplant Unit, B.C. Cancer Agency.
KAREN E. WATSON, B.Sc.N. (Tor.), M.S.N. (Brit. Col.), R.N., Director of Nursing, Geriatric Department, Riverview Hospital.
JOAN WEARING, B.N. (McG.), M.N. (Wash.), R.N., Home Care Coordinator, Vancouver Health Department.
WENDY WINNSLOW, B.S.N., M.S.N. (Brit. Col.), R.N.
JUHFEE ZIMMERMAN, B.S.N. (Iowa Wesleyan), M.Ed. (Calg.), R.N., Acting Director, Strategic Planning, Mental Health Services.
- Clinical Assistant Professors**
CAROLYN BAKER, B.Sc.N., M.Sc.N. (Tor.), R.N., Clinical Nurse Specialist, Oncology, Vancouver Hospital and Health Sciences Centre.
JANIE BROWN, B.S.N., M.S.N. (Brit. Col.), Clinical Nurse Specialist.
DOREEN HATTON, B.S.N., M.S.N. (Brit. Col.), R.N., Nurse Clinician/Clinical Nurse Specialist/Educator and Consultant, Diabetes Program, B.C.'s Children's Hospital.
CAROLYN IKER, B.S.N., M.S.N. (Brit. Col.), R.N., Perinatal Clinical Nurse Specialist, Grace Hospital.
HOLLY KENNEDY-SYMONDS, B.Sc. (Brandon), M.H.Sc. (Health Care Practice) (McM.), R.N., Coordinator, Healthy Heart Program, St. Paul's Hospital.
KAREN KLINE, B.Sc.N., M.Sc.N. (Tor.), R.N., Clinical Nurse Specialist, Gerontology, Lions Gate Hospital.
KATHERINE I. McINDOE, B.S.N., M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Lions Gate Hospital.
PATRICIA PORTERFIELD, B.Sc.N. (Alta.), M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Palliative Care, Vancouver Hospital and Health Sciences Centre.
GWEN REMPEL, B.S.N., M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Cardiology/Cardiac Care, B.C.'s Children's Hospital.
MAUREEN SHAW, B.N., M.N. (Calg.), R.N., Clinical Nurse Specialist, Rehabilitation, Holy Family Hospital.
CYNTHIA STUTZER, B.S.N. (Delaware), M.S. (Oklahoma), R.N., Clinical Nurse Specialist, Pediatric Oncology, B.C.'s Children's Hospital.
LINDA TURNER, B.N., M.N. (Manit.), R.N., Clinical Nurse Specialist, Pain Management, Vancouver Hospital and Health Sciences Centre.
- Clinical Instructors**
DAWN BLAIS, B.S.N., M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Gerontology, St. Paul's Hospital.
DONELLE CLARKE, B.S.N. (Sonoma State), M.S.N. (Calif., San Francisco), R.N., Perinatal Clinical Specialist, B.C.'s Children's Hospital.
LILY LEE, B.N. (Manit.), M.S.N. (Texas), R.N., Clinical Nurse Specialist, Perinatal Care, Royal Columbian Hospital.
LINDA NIXON, B.S.N. (Vic.B.C.), M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist in Pain Relief, British Columbia Cancer Agency.
BARBARA PEREHUDOFF, B.S.N., M.S.N. (Brit. Col.), R.N., Perinatal Clinical Nurse Specialist, Grace Hospital.
JANICE RADFORD, B.S.N., M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Sunny Hill Hospital for Children.
- MONA G. RECHNER, B.S.N., M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Oncology, Lions Gate Hospital.
JOCELYN REIMER-KENT, B.N., M.N. (Manit.), R.N., Clinical Nurse Specialist, Cardiac Surgery, Royal Columbian Hospital.
LEAH E. SHAPER, B.S.N., M.S.N. (Brit. Col.), R.N., Geriatric Clinical Specialist, Mount St. Joseph Hospital.
JANICE STANBURY, B.S.N. (Sask.), M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist, Geriatric Program, St. Paul's Hospital.
SHARON TOBERT, B.S.N., M.A. (Brit. Col.), R.N., Prevention Nursing Supervisor, Burrard Health Unit, Vancouver Health Department.
RENA VAN DER WAL, B.S.N. (Brit. Col.), M.N. (Alta.), R.N., Clinical Nurse Specialist, Vancouver Hospital and Health Sciences Centre.
LINDA YEARWOOD-DANCE, B.S.N., M.S.N. (Brit. Col.), R.N., Clinical Nurse Specialist-Home Care, Vancouver Health Department.
- Clinical Staff in Associated Agencies**
British Columbia Cancer Agency
British Columbia's Children's Hospital
Burnaby Health Department
Burnaby Hospital
Grace Hospital
Lions Gate Hospital
Provincial Health Department, Boundary Health Unit, Central Fraser Valley Health Unit, and New Westminster Unit.
The Richmond Hospital
Richmond Health Department
St Paul's Hospital
St Vincent's Hospital
Vancouver Health Department
Vancouver Hospital and Health Sciences Centre

The Faculty of Pharmaceutical Sciences was established in 1945 and is housed in the George T. Cunningham Building. The first wing of the building was completed in 1960 and is used primarily for the undergraduate program. The research wing was completed in 1970 and provides space for the graduate program. The administrative offices of the Faculty are located on the first floor of the Cunningham Building, 2146 East Mall.

Bachelor of Science in Pharmacy — B.Sc. (Pharm.)

The course 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 community pharmacies and hospitals, in industry and government service and other specialized fields. This course satisfies the requirement of the Pharmacists 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 Association of Faculties of Pharmacy of Canada.

Part-Time Program of Study

Students may be admitted to part-time study programs toward the degree B.Sc. (Pharm.).

- 1) A program of studies will be arranged with each individual by the Office of the Dean.
- 2) Courses must be scheduled on the basis of the current timetable at the time of registration.
- 3) Courses of the fourth year constituting the required courses (20 credits) must be taken concurrently.
- 4) Total time allowed for the completion of the degree is eight years.

Admission

For admission to the Faculty it is required that the student shall have completed the First Year in the Faculty of Science with credit for the courses shown below and an average grade of at least 60%, or that he or she shall have fulfilled the equivalent of these courses by work taken in an approved college or university.

Students are not admissible to the Faculty directly from Grade 12 or Grade 13 obtained in any province. Such students should seek admission to the Faculty of Science at UBC if they are residents of B.C., otherwise they should complete the equivalent of the following required courses at their own provincial universities.

The required prerequisite subjects are: Biology 120 (3) and one of Biology 110 (3), Biology 115 (3) or 80% or better in Biology 12; Chemistry 110 (6) or Chemistry 121 (3), and Chemistry 122 (3); six credits of first year English; Mathematics 100 (3) and Mathematics 101 (3); six credits of first year university Physics with a laboratory. Students who have completed Science One, including six credits of English, may apply.

Students accepted into the Faculty must consult the Office of the Dean with regard to an approved program.

English Requirements

To qualify for the degree of B.Sc. (Pharm.) students must satisfy the Faculty of Pharmaceutical Sciences English Requirement. To do this, students must obtain six credits of first-year English. Other English requirements are under Faculty review.

Note: Satisfactory completion of the Language Proficiency Index (LPI) is prerequisite to all first-year English courses at UBC. (See *Calendar* index under Language Proficiency Index.)

The Faculty of Pharmaceutical Sciences

The Faculty of Pharmaceutical Sciences offers courses leading to the degree of Bachelor of Science in Pharmacy, B.Sc. (Pharm.) and to the degrees of Master of Science (M.Sc.), Doctor of Pharmacy (Pharm.D.) and Doctor of Philosophy (Ph.D.).

Application

All applicants applying for entry into the Faculty must make formal application to the Registrar of the University as early as possible in the year, and in any event, not later than April 30. An applicant should procure an application form from the Registrar's Office so that it can be completed on or before that date whether or not transcripts are then available. Late applications will not be considered.

Due to lack of space, enrolment in the Faculty is limited. Applicants should therefore regard the satisfying of the entrance requirements as meaning only that they are eligible for selection and that such selection shall be solely within the discretion of the Faculty of Pharmaceutical Sciences. Preference is given to well qualified residents of British Columbia.

When notified that application has been accepted, each applicant shall, within two weeks of notification, send to the Office of the Dean of the Faculty of Pharmaceutical Sciences, a deposit of one hundred dollars (\$100) by cheque payable to the University of British Columbia, which will later be applied to the tuition fees. The deposit is non-refundable if the student fails to attend the session in the Faculty.

Note: The deposit of \$100 is payable only by those applicants who receive official notification of their admission to the Faculty of Pharmaceutical Sciences and should **not** be sent in with the initial application for admission.

Registration

Applicants who are accepted will be sent a letter of acceptance and details of the registration procedures.

Attendance, Examinations and Advancement

- 1) Regular attendance is expected of students in all their classes (including lectures, laboratories, tutorials, and seminars). 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 physician to the University Student Health Service, as promptly as possible.
- 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, because of failure to maintain a

satisfactory standing in laboratory work, or because of absence from an appreciable number of laboratory periods through illness or other causes.

- 4) The passing mark for a course in the Faculty of Pharmaceutical Sciences is 50%.
- 5) A student who has failed in 12 credits or more 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.
- 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.
- 7) Term essays and examination papers may be refused a passing mark if they are noticeably deficient in English.
- 8) 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 that student is considered to be unsuited to proceed with the study or practice of pharmacy.

Dean's Honour List

Graduating students and students promoted to Second, Third or Fourth Year with a standing of "A-" or better in the previous winter session will receive the notation "Dean's Honour List" on their records. A program of at least 30 credits must have been carried in order to receive this designation.

Promotion Requirements

To be promoted, a student in the Faculty of Pharmaceutical Sciences must:

- 1) Pass all of the required courses of the program year in which the student is registered.
- 2) Obtain a minimum average standing of 60% in the required courses of the program year in which the student is registered.

The following notes apply to these requirements:

- Required courses, with the exception of English 301, are used for this computation; thus elective courses are excluded. Failure in elective courses requires that the course be repeated, or an approved alternative course be taken.
- A student who by these regulations is not promotable may be required to repeat the work of that year or to withdraw from the Faculty and will not be able to take any of the required courses of subsequent years.

- A student who fails to meet promotion standards for a second time either in a repeated year or a subsequent year, will normally be required to withdraw from the Faculty.
- 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 for all courses taken may not exceed 38 credits except with approval of the Dean of the Faculty.
- A student with standing deficient in more than six credits, although not permitted to register in the higher year, may be allowed to continue by registering in the lower year and taking courses in accordance with Paragraph 1 above.

Supplementals and Examinations for Higher Standing

Supplemental examinations are not available in all courses. In courses in which proficiency is judged on a continuing basis throughout a term, or in which final examinations are not given, or in courses where the final examination contributes less than 40% of the course grade, no supplemental examinations are provided. In courses where supplemental examinations are allowed, it is recommended that the supplemental examination should be a comprehensive examination of the full year's work and should receive a substantial value of the total mark. The supplemental mark should replace all of the marks received on the written examinations of the lecture content of the course.

- 1) In courses where supplemental examinations are allowed, a student who has obtained an average of at least 50% in the final examinations of the session, may be granted supplemental examinations in the subject or subjects failed provided a final grade of not less than 40% was obtained. Notices will be sent to students to whom such supplemental examinations have been granted.
- 2) In any one session no candidate will normally be granted supplemental privileges in more than six credits.
- 3) A student who has failed in 12 credits or more 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) A supplemental examination may be written only once except in the case of a Final Year student who may write twice. Should a supplemental be failed the course concerned must be repeated or a suitable substitute taken.
- 5) Where supplemental privileges are granted, the standing shall be recalculated for purposes of promotion based on the actual marks obtained in these examinations.
- 6) In any one session, for purposes of promotion, a student may be allowed to rewrite a maximum of six credits of course work for higher standing. These six credits of course work will be the subject or subjects in which the student has obtained the lowest standing or at the discretion of the Dean.
- 7) The total of supplementals and examinations for higher standings should not normally exceed six credits.

Requirements for Registration

Registration with the College of Pharmacists of British Columbia:

1) Student Registration

It is required that students register with the College of Pharmacists of British Columbia during their first year

in the Faculty of Pharmaceutical Sciences. This registration will be completed during the first week of Winter Session Term 1. Proof of such registration will be a requirement for admission to the Professional Practice Laboratory.

2) Pharmacist Registration

The possession of a B.Sc. (Pharm.) 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 pharmacist with the College of Pharmacists of British Columbia.

Details of these requirements may be obtained from the Registrar of the College of Pharmacists, Suite 200, 1765 West 8th Avenue, Vancouver, B.C. V6J 1V8; telephone (604) 733-2440.

Pharmacy Examining Board of Canada

The Board provides for 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. Information relative to the dates of examinations, application forms, etc., may be obtained from the Registrar, Pharmacy Examining Board of Canada, Suite 603, 123 Edward Street, Toronto, Ontario M5G 1E2; telephone (416) 979-2431.

Continuing Education

Continuing Education is sponsored jointly by the Faculty of Pharmaceutical Sciences and the College of Pharmacists of British Columbia. The co-ordination of the programs is through the Division of Continuing Education in the Health Sciences.

The program is directed to the following objectives:

- 1) to provide a means by which pharmacists can systematically update their knowledge through a planned program of instruction in specific areas of pharmaceutical sciences.
- 2) to provide courses giving pharmacists broader and deeper insights into special subject areas.
- 3) to provide courses directed to the needs of a particular specialty within the profession, e.g., Hospital Pharmacy.

First Aid

It is recommended that all pharmacy students obtain credit for a recognized First Aid course, e.g., St. John Ambulance S.O.F.A. First Aid Course, while completing their B.Sc. (Pharm.) degree.

Curriculum

First Year

Course	Credits	Term 1		Term 2			
		Lect.	Lab.	Lect.	Lab.		
CHEM 230	6	Organic Chemistry	3	3	3	3	
MICB 200	6	Introductory Microbiology	3	2	3	2	
PHAR 100	1	Professional Practice I	2	3 ¹	2	3 ¹	
PHAR 211	8	Drug Delivery Systems	4	3 ¹	4	3 ¹	
ENGL 301	3	Technical and Business Writing	3	0	or	3	0
	6	Elective ²	3	0	3	0	
Total	33						

Second Year

Course	Credits	Term 1		Term 2		
		Lect.	Lab.	Lect.	Lab.	
ANAT 390	1	Basic Human Anatomy	2	0	2	0
BIOC 300	6	Principles of Biochemistry	3	0	3	0
PHAR 200	1	Professional Practice II	2	3 ¹	2	3 ¹

PHAR 311	1	Drug Delivery Systems II	2	3 ¹	2	3 ¹	
PHAR 370	4	Drugs: Chemistry, Pharmacology and Therapeutics I	0	0	4	0	
PHYL 301	6	Human Physiology	3	0	3	0	
PHYL 302	3	Human Physiology Laboratory	0	3	0	3	
	3	Elective	3	0	or	3	0
Total	34						

Third Year

Course	Credits	Term 1		Term 2			
		Lect.	Lab.	Lect.	Lab.		
PHAR 300	2	Professional Practice III	1	3 ³	1	3 ³	
PHAR 301	3	Self-Medication Products	0	0	3	0	
PHAR 315	4	Pharmacokinetics	4	0	0	0	
PHAR 325	1	Pharmaceutical Analysis	1	3	0	3	
PHAR 351	3	Introduction to Pharmacy Management	3	0	0	0	
PHAR 360	3	Introduction to Pharmaceutical Biotechnology	0	0	3	0	
PHAR 380	6	Drugs: Chemistry, Pharmacology and Therapeutics II	6	2 ¹	0	0	
PHAR 385	6	Drugs: Chemistry, Pharmacology and Therapeutics III	0	0	6	2 ¹	
	3	Elective ²	3	0	or	3	0
Total	34						

Fourth Year

Course	Credits	Term 1		Term 2			
		Lect.	Lab.	Lect.	Lab.		
PHAR 402	6	Clinical Clerkship I	1	5	1	5	
PHAR 403	3	Clinical Clerkship II	1	4	or	1	4
PHAR 469 ⁵	0	Professional Practice Clerkship					
PHAR 480	6	Drugs: Chemistry, Pharmacology and Therapeutics IV	6	2 ¹			
	16	Electives ⁶ (minimum)					
Total	31						

¹ Alternate weeks.

² Recommended electives could include ECON 100, PSYC 100, Commerce courses, Languages, Humanities, PHIL 407, 414, 457, Science courses.

³ Laboratories in alternate weeks.

⁴ Tutorial Seminars in alternate weeks.

⁵ Compulsory. Taken in summer immediately prior to entering 4th year.

⁶ The student should elect an area of interest from those listed below and select appropriate courses, with the approval of the Dean and Faculty Advisers. Ten elective credits are to be chosen from offerings within the Faculty and six credits chosen from outside the Faculty. All courses selected to meet these requirements must be approved by the Dean's Office. An interdisciplinary course that is strongly recommended is HCET 400 - Health Care Ethics (three credits).

Areas of Interest

- 1) Community Pharmacy
- 2) Hospital Pharmacy
- 3) Governmental and Industrial Pharmacy
- 4) Graduate Studies
- 5) Nuclear Pharmacy

Courses offered in Pharmaceutical Sciences

Pharmaceutics: PHAR 100, 200, 211, 311, 315, 412, 414, 415, 416, 417.

Pharmaceutical Chemistry: PHAR 325, 425, 426, 428, 429.

Pharmacognosy: PHAR 434, 437.

Pharmacology: PHAR 435, 440, 444, 448.

Clinical Pharmacy: PHAR 402, 403, 404, 405, 408, 409.

Pharmacy Administration: PHAR 351, 452, 453, 454, 455, 458.

Integrated Core: PHAR 370, 380, 385, 480.

Radiopharmacy Residency

Specialized postgraduate training in the application and handling of radio pharmaceuticals used in diagnosis and therapy is offered by the Vancouver General Hospital in affiliation with the Faculty of Pharmaceutical Sciences. Further information is available from the Faculty upon request.

Hospital Pharmacy Residency Program

A one-year postgraduate hospital pharmacy residency program is offered by a number of hospitals in British Columbia in affiliation with the Faculty of Pharmaceutical Sciences and the B.C. Branch of the Canadian Society of Hospital Pharmacists. These residencies are conducted following standards established for accreditation by the Canadian Hospital Pharmacy Residency Board. Residencies normally commence in June of each year. Those selected are registered as Residents in the Faculty of Pharmaceutical Sciences and are assessed the applicable program fee as indicated in the fee section of the *Calendar*. The residencies are offered by the Departments of Pharmacy in the following hospitals:

British Columbia's Children's Hospital, Vancouver
Burnaby Hospital
Lions Gate Hospital, North Vancouver
Royal Columbian Hospital, New Westminster
Royal Inland Hospital, Kamloops
St. Paul's Hospital, Vancouver
Surrey Memorial Hospital
Vancouver Hospital and Health Sciences Centre

Admission

Graduates of any Canadian pharmacy school are eligible for admission. All candidates must satisfy the requirements for registration with the College of Pharmacists of B.C. Graduates of foreign pharmacy schools must be registrants of the Pharmacy Examining Board of Canada. The selection is highly competitive and is determined using a matching process conducted by the B.C. Hospital Residency Program Committee based on applicant hospital preferences, interviews, letters of reference, and academic performance during the undergraduate pharmacy program.

Residency Program Completion Requirements

The residency program consists of required and elective rotations in the resident's hospital and other affiliated hospitals and agencies. A certificate signifying completion of the program is awarded jointly by the hospital and the University based on satisfactory performance in rotation assignments, oral and written assessments, and project work as determined by the B.C. Hospital Pharmacy Residency Program Committee.

Application

Application forms and descriptive literature may be obtained from the Associate Dean, Professional Programs, Faculty of Pharmaceutical Sciences, The University of British Columbia, 2116 East Mall, Vancouver, B.C., V6T 1Z3, Canada. Inquiries may also be directed to the residency coordinators in the pharmacy departments in any of the hospitals offering a residency program. The closing date for submission of completed applications is usually late November for entry into programs commencing in June.

Awards and Financial Assistance

A supplement to the *Calendar*, entitled *Awards and Financial Aid*, contains a list of current academic awards (scholarships, prizes, etc.) and available financial assistance (grants, bursaries and loans). Students are encouraged to consult the above to determine awards for which they may be eligible. For further information and application forms contact the University Awards Office, The University of British Columbia, Vancouver, B.C., V6T 1Z3.

The following awards are not administered by the University Awards Office.

Graduate Fellowships in Hospital Pharmacy (Four at \$500 Each)

Four Graduate Fellowships in Hospital Pharmacy are offered for annual competition among graduates from Canadian Schools of Pharmacy to assist the recipients during a one-year hospital pharmacy residency program. To be eligible, applicants must have been accepted for a residency program approved by the Canadian Hospital Pharmacy Residency Board. Applications must be received by the Canadian Foundation for Pharmacy office by June 1. Application forms are available in the office of the Dean or from the Canadian Foundation for Pharmacy office.

Fellowships in Professional Practice (Four at \$500 each)

Four Fellowships in Professional Practice are offered for annual competition among graduates from Canadian Schools of Pharmacy to applicants presenting study programs in any professional area (i.e., research, clinical pharmacy, radio pharmacy, drug information service, public health, poison control, etc.). Applications must be received by the Canadian Foundation for Pharmacy office by June 1. Application forms are available in the office of the Dean or from the Canadian Foundation for Pharmacy office.

Fellowships in Industrial Pharmacy (Four at \$250 each)

Four Fellowships in Industrial Pharmacy are offered for annual competition among students registered in Canadian Schools of Pharmacy who have completed an Industrial Pharmacy Summer Studentship Program. Applications must be received by the Canadian Foundation for Pharmacy office by September 30. Application forms are available in the office of the Dean or from the Canadian Foundation for Pharmacy office.

Graduate Studies

For details of Graduate Studies see the Faculty of Graduate Studies section of the *Calendar*.

Doctor of Pharmacy Program

A two-year post-baccalaureate professional degree providing advanced training in clinical pharmacy practice. Graduates of the program are prepared to function as clinical pharmacy practitioners, educators and researchers in hospitals, universities, government or industry. Course requirements for the first year are outlined in the Graduate Studies Section of the *Calendar*. Year 2 is comprised of 12 months of required and elective clinical clerkships which will take place in the following institutions: British Columbia Cancer Agency, B.C. Drug and Poison Information Centre, Children's/Grace/University Hospital (Shaughnessy Site), Greater Victoria Hospital Society, Lion's Gate Hospital, Riverview Hospital, Royal Columbian Hospital, St. Paul's Hospital, University Hospital (UBC Site), Vancouver General Hospital. For further information on the program, refer to the Faculty of Graduate Studies section of the *Calendar*.

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- B.C. Drug and Poison Information Centre - Jennifer Anderson, R.N., C. Laird Birmingham, B.Sc. (Brit. Col.), Cheryl Brabbins, R.N., James R. Busser, M.D., FRCPC, M.H.Sc. (Brit. Col.), Barbara Cadario, B.Sc. (Pharm.) (Ont.), M.Sc. (Brit. Col.), Lauren Cornelison, R.N., B.Sc.N. (Brit. Col.), Gunnar Erhardt, M.D. (Brit. Col.), Joseph G. Haegart, M.D. (Brit. Col.), FRCPC, Lynn Hayes, R.N., B.A. (Brit. Col.), James R. Kennedy, M.D., FRCPC, Anne Leatham, B.S.P., M.S.P. (Brit. Col.), Dennis Leong, B.Sc. (Pharm.) (Brit. Col.), Kathy Lepik, B.Sc. (Pharm.) (Brit. Col.), Raymond Li, B.Sc., B.Sc. (Pharm.) (Brit. Col.), Beverly Louis, B.Sc. (Pharm.) (Brit. Col.), Larry Lynd, B.S.P. (Sask.), Marion McGarry, R.N., Kathryn McInnes, B.Sc. (Pharm.) (Alta.), Allan McKinnon, B.Sc. (Pharm.) (Brit. Col.), M. Ed. (Gonzaga, Spokane, Wash.), Jake Onrot, B.Sc., M.D. (Ont.), FRCPC, Roy A. Purcell, M.D., FRCPC, Janet Webb, B.Sc. (Pharm.) (Brit. Col.), M.Sc. (Med.) (Nfld.).
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- Prince Rupert Hospital - Mark Brady, B.Sc. (Pharm.) (Brit. Col.), Tracy Davies, B.Sc. (Pharm.) (Brit. Col.).
- Queen's Park Hospital - Andrea Westowski, B.S.P. (Brit. Col.).
- The Richmond Hospital - Steve Chong, B.Sc. (Pharm.) (Brit. Col.), Joe Jacob, B.Sc. (Pharm.) (Brit. Col.), Elena Jean, B.Sc. (Pharm.) (Brit. Col.), Robert McCollom, B.Sc. (Pharm.) (Brit. Col.), Keith McDonald, B.Sc. (Pharm.), M.B.A. (Brit. Col.), Neda McDonald, B.Sc. (Pharm.) (Brit. Col.), Leslie Wong, B.Sc. (Pharm.) (Brit. Col.), Claudia Woher, B.Sc. (Pharm.) (Brit. Col.), Stella Wong, B.Sc. (Pharm.) (Minn.), Vincent Wong, B.Sc. (Pharm.) (Brit. Col.).
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- Royal Columbian Hospital - Brad Anutooshkin, B.Sc. (Pharm.) (Brit. Col.), Robert Balen, B.Sc. (Pharm.) (Brit. Col.), Frances Chow, B.Sc. (Pharm.) (Brit. Col.), Todd Cooper, B.Sc. (Pharm.) (Brit. Col.), Sherry Coutts, B.Sc. (Pharm.) (Brit. Col.), Donna Davie, B.Sc. (Pharm.) (Brit. Col.), Kristol Dyck, B.Sc. (Pharm.) (Brit. Col.), Wendy Gordon, B.Sc. (Pharm.) (Brit. Col.), Lenora Ho, B.Sc. (Pharm.) (Brit. Col.), Richard Slavik, B.Sc. (Pharm.) (Brit. Col.), Dale Toews, B.Sc. (Pharm.) (Brit. Col.), Paul Vance, B.Sc. (Pharm.) (Alta.).
- Royal Inland Hospital - Roger Allegretto, B.Sc. (Pharm.) (Brit. Col.), Greg Atherton, B.Sc. (Pharm.) (Brit. Col.), Nunzio Barone, B.Sc. (Pharm.) (Brit. Col.), Laurel Cleland, B.S.P. (Sask.), Lois Devick, B.S.P. (Sask.), Anna Folk, B.Sc. (Pharm.) (Brit. Col.), Ayesha Hassan, B.Sc. (Pharm.) (Brit. Col.), Jordan Marshall, B.Sc. (Pharm.) (Brit. Col.), Allan Nethrown, B.S.P. (Sask.), Elvia Perdomo, Dipl. (Pharm.) (El Salvador), Kay Suzuki, B.Sc. (Pharm.) (Brit. Col.), Mary-Lou Troje, B.Sc. (Pharm.) (Brit. Col.), Dan Wildeman, B.Sc. (Pharm.) (Brit. Col.), Kim Winters, B.Sc. (Pharm.) (Brit. Col.), Cynthia Wong, B.Sc. (Pharm.) (Brit. Col.), Ken Wou, B.Sc. (Pharm.) (Brit. Col.).
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- St. Paul's Hospital — Linda Akagi, B.Sc. (Pharm.) (Brit. Col.), Steve Barnes, B.Sc. (Pharm.) (Brit. Col.), Caroline Briggs, B.Sc. (Pharm.) (Brit. Col.), Anna Callegari, B.Sc. (Pharm.) (Brit. Col.), Jane Cassidy, B.Sc. (Pharm.) (Sask.), Conley Chee, B.Sc. (Pharm.) (Alta.), Jack Da Silva, B.Sc. (Pharm.) (Brit. Col.), Brad Davie, B.Sc. (Pharm.) (Brit. Col.), Pamela Grant, B.Sc. (Pharm.) (Brit. Col.), Loretta Harrington, B.Sc. (Pharm.) (Brit. Col.), Sheri Hart, B.Sc. (Pharm.) (Alta.), Gregory Head, B.Sc. (Pharm.) (Brit. Col.), Joanne Jung, B.Sc. (Pharm.) (Brit. Col.), Gordion Klammer, B.Sc. (Pharm.) (Brit. Col.), Andria Lee, B.Sc. (Pharm.) (Brit. Col.), Helen Lee, B.Sc. (Pharm.) (Brit. Col.), Mariama Leung, B.Sc. (Pharm.), Patty Lew, B.Sc. (Pharm.) (Brit. Col.), Susan Lin, B.Sc. (Pharm.) (Brit. Col.), Alan Low, B.Sc. (Pharm.) (Brit. Col.), Kelly Mahannah, B.Sc. (Pharm.) (Brit. Col.), Gordon McGreevy, B.S.P. (Sask.), Pauline Mosbertan, B.Sc. (Pharm.) (Brit. Col.), Marc Pavan, B.Sc. (Pharm.) (Brit. Col.), Melita Prashnick, B.Sc. (Pharm.) (Brit. Col.), Mami Sakamoto, B.Sc. (Pharm.) (Brit. Col.), Nimura Shiyui, B.Sc. (Pharm.) (Brit. Col.), Nick Torok, B.Sc. (Pharm.) (Brit. Col.), Ronald Wall, B.Sc. (Pharm.) (Brit. Col.), Jennifer Wong, B.Sc. (Pharm.) (Brit. Col.).
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- Victoria General Hospital — Ron Ballard, B.Sc. (Pharm.) (Brit. Col.), Alexander Dubyk, B.Sc. (Pharm.) (Alta.), Greg McKelvie, B.Sc. (Pharm.) (Brit. Col.), Pharm.D. (Philadelphia College of Pharmacy and Science), Ron Ballard, B.Sc. (Pharm.) (Brit. Col.).
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Col.), DARYL WING, B.Sc. (Pharm.) (Brit. Col.), CANDICE WONG, B.Sc. (Pharm.) (Brit. Col.), ELANORE WONG, B.Sc. (Pharm.) (Brit. Col.), GARY WONG, B.Sc. (Pharm.) (Brit. Col.), GERTI WONG, B.Sc. (Pharm.) (Brit. Col.), GRACE WONG, B.Sc. (Pharm.) (Brit. Col.), WEN WONG, B.Sc. (Pharm.) (Brit. Col.), MARY WOOD, B.Sc. (Pharm.) (Brit. Col.), DON WYLLICHUK, B.Sc. (Pharm.) (Brit. Col.), GERRY YAGER, B.Sc. (Pharm.) (Brit. Col.), TOM YAN, B.Sc. (Pharm.) (Brit. Col.), CHEE YANG, B.Sc. (Pharm.) (Brit. Col.), RUSSELL YEN, B.Sc. (Pharm.) (Brit. Col.), AMY YEUNG, B.Sc. (Pharm.) (Brit. Col.), RICHARD YIP, B.Sc. (Pharm.) (Brit. Col.), SOPHIA YIP, B.Sc. (Pharm.) (Brit. Col.), DAVID YOUNG, B.Sc. (Pharm.) (Brit. Col.), JANE YOUNG, B.Sc. (Pharm.) (Brit. Col.), NORM YU, B.Sc. (Pharm.) (Brit. Col.), VINCE ZUCCARO, B.Sc. (Pharm.) (Brit. Col.), ELIZABETH ZYGUMNT, B.Sc. (Pharm.) (Brit. Col.).
- Regional Co-ordinators of Continuing Pharmacy Education**
- NUNZIO BARONE, B.Sc. (Pharm.) (Brit. Col.), JOANNE BROWN, B.Sc. (Pharm.) (Brit. Col.), JENNIFER CHATTERSON, B.Sc. (Pharm.) (Birmingham), JAMES CHIU, B.Sc. (Pharm.) (Brit. Col.), DON COCAR, B.Sc. (Pharm.) (Brit. Col.), JENNIFER COOLEN, B.Sc. (Pharm.) (Dal.), WENJY CSFEK, B.Sc. (Pharm.) (Brit. Col.), MARK DICKSON, B.Sc. (Pharm.) (Brit. Col.), JULIE FAUX, B.Sc. (Pharm.) (Brit. Col.), CATHERINE HAMM, B.Sc. (Pharm.) (Brit. Col.), KATHRYN HAWKINS, B.Sc. (Pharm.) (Brit. Col.), SHANAIRWIN, B.Sc. (Pharm.) (Brit. Col.), MERV KOSZMAN, B.Sc. (Pharm.) (Brit. Col.), WAYNE KROSCHINSKY, B.Sc. (Pharm.) (Brit. Col.), SUKHI LALLI, B.Sc. (Pharm.) (Brit. Col.), STEVE LEONG, B.Sc. (Pharm.) (Brit. Col.), NESTA MCGRAW, B.Sc. (Pharm.) (Brit. Col.), DARCY McMURFIE, B.Sc. (Pharm.) (Brit. Col.), MEGAN MAITLAND, B.Sc. (Pharm.) (Brit. Col.), MARSHALL MOLESCHIL, B.Sc. (Pharm.) (Brit. Col.), LYNN MOORE, B.Sc. (Pharm.) (Brit. Col.), LYNN POLLOCK, B.Sc. (Pharm.) (Brit. Col.), BONNIE POPP, B.Sc. (Pharm.) (Brit. Col.), JIM POTTS, B.Sc. (Pharm.) (Brit. Col.), MOJAMED REHMTULLA, B.Sc. (Pharm.) (Brit. Col.), HOWARD ROSE, B.Sc. (Pharm.) (Brit. Col.), JOHN SHANKE, B.Sc. (Pharm.) (Brit. Col.), WAYNE SHIELLEY, B.Sc. (Pharm.) (Brit. Col.), CHRIS SUTTON, B.Sc. (Pharm.) (Brit. Col.), JULIE WHITE, B.Sc. (Pharm.) (Brit. Col.).

The West Coast College of Massage Therapy

6th Floor, Spencer Building, Harbour Centre, P.O. Box 12110, 555 West Hastings St., Vancouver, BC V6B 4N4

Since the West Coast College of Massage Therapy (WCCMT) was founded, it has striven to maintain the highest standards of Massage Therapy education in North America. The College has integrated many forms of massage and manual therapy into a synthesis with health science and professional development. This synthesis raises the foundation of traditional massage to the present day professional practice of Massage Therapy.

Practice in Massage Therapy

A career in Massage Therapy offers an exciting and rewarding opportunity to be part of the health care professional community. Massage Therapists in BC are licensed under the Health Professions Act. The majority of WCCMT graduates are self-employed in private practice, alone or with other health care professionals. Massage Therapy is currently covered by the BC Medical Services Plan for treatment and rehabilitation of a wide variety of injury and disease including acute and chronic soft-tissue injuries and pain and stress management.

Program Description

Our comprehensive program guides students through a curriculum that carefully balances theory and practice. The subjects of anatomy, physiology, kinesiology and pathology form the basis of the academic curriculum. Clinical training covers a wide scope for technique within the modalities of massage, hydrotherapy and therapeutic exercise. The College's Professional Development program integrates academic and clinical training in the context of effective professional practice. Internship includes practical experience in the College's Public Teaching Clinics, and participation in Community and Hospital Outreach programs.

For more information on WCCMT Public Clinics or to make an appointment please phone 685-5801 in Vancouver or 437-5801 in the Burnaby area.

Instruction Standards

Academic classroom instructors at the College have post-graduate degrees in their instructional subject and/or have a degree in health care. Practical classroom instructors are Registered Massage Therapists or Physiotherapists with a minimum of 3000 hours of clinical experience. Clinic Instructors are Registered Massage

Therapists with a minimum of 2000 hours of clinical experience. The College's quality assurance model provides for excellent instructor to student ratios.

Reasons for Choosing WCCMT

The West Coast College of Massage Therapy offers:

- ✓ an attractive, modern, fully equipped facility
- ✓ diverse and highly qualified instructors
- ✓ world class clinic treatment facility
- ✓ a convenient location in beautiful downtown Vancouver, directly above Simon Fraser University Downtown Campus
- ✓ graduation with the highest standard of health science and clinical education for Massage Therapy available in the world

Academic Prerequisites

To qualify, applicants must have a minimum of high school graduation with Grade 12 Biology. Chemistry 12 is highly recommended for 1994-95 applicants and will be required as of September 1995. The following are alternatives to the above minimum requirement:

- ✓ an RN degree or diploma
- ✓ a University degree
- ✓ one complete year of post-secondary biology (anatomy/physiology acceptable), plus one additional post-secondary science course.
- ✓ Qualified applicants are accepted on a **first-come-first-serve basis**.

Application Procedure

For further information or to request a College calendar, please call: (604) 689-9686.

College Accreditation

- ✓ Accredited by the B.C. Ministry of Health since 1981
- ✓ Approved for federal and provincial student loan eligibility since 1983
- ✓ Eligible to accept foreign students under the Immigration Act since 1987
- ✓ Registered with the Private Post-Secondary Education Commission

WCCMT Instructional Faculty

Steve Anderson, B.Sc., RMT
Laurie Baird, RMT
Tracy Barber, RMT
Joan Borutski, B.A., RMT
Don Campbell, RMT
Dave Coombes, B.P.E., RMT
Leslie Crawford, RMT
Michael Dixon, RMT
•Robert Fargher, M.Sc., PhD
Lynne Feehan, B.Sc.P.T.,
M.Sc.P.T., CHT
Ron Garvoek, RMT
Donna Gaylie, R.P.C.

Pam Giberson, M.Sc., PhD
Tina Hansen, RMT
David Harper, M.Sc., PhD
Robert Harris, B.Sc., RMT
Brita Hobkirk, RMT
Ann Hopper, RMT
Lisa Humphries, RMT
Susann Ignatzi, RMT
Dana Janssen, M.Ed., R.C.C., RMT
Delia Johnson, RMT
Stanley Jung, D.C.
Russell Kang, B.P.E., D.C.
Scott Kittleson, RMT

Melba Lewis, R.N., RMT
Judith Mallet, RMT
Anna Marra, RMT
Vasanto Melina, B.A., M.A., R.D.
Glenn Morrow, B.Sc., PhD
Heather Narod, R.N., RMT
David Olson, D.C.
Steve Picton, RMT
Natale Rao, RMT
John Ranney, RMT
Claudia Scrivener, M.Sc., P.T.
Jean Stevens, RPT

Margaret Strongitham,
B.Sc. D.C.
Lorita Tang, B.A., RMT
Raiili Touchet, RPN, RMT
Brenda Wilkinson, RMT
Erika Williams, RMT
John Yates, M.Sc., PhD
Bradley Yee, B.Sc., D.C.
Clifford Yip, RMT

WEST COAST COLLEGE OF
WCCMT
MASSAGE THERAPY INC

UBC does not endorse any advertiser in this publication.

Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

Practice in Occupational Therapy and Physical Therapy

Occupational therapy and physical therapy are health professions primarily concerned with reducing the effects of impairment or disability on a person's ability to move and function in everyday life. Functional impairment and disability may result from injury, disease, developmental disorders, or the aging process, and may affect a person's physiological systems, sensation, movement, or emotional or intellectual function.

In many settings, therapists serve as members of a team of rehabilitation specialists, including physicians, nurses, social workers, special educators, speech pathologists and psychologists. Occupational therapists and physical therapists may work in hospitals, rehabilitation centres, psychiatric institutions, industrial facilities, government and voluntary health agencies, schools, extended care facilities, the client's home, or in private practice.

Occupational Therapists are concerned with the effects of various conditions on the life performance of their clients. Following a thorough assessment of the client's abilities and skills, occupational therapists implement treatment and intervention programs which enable maximum independence in the home, community or workplace. They do so through the use of carefully selected activities designed to increase functional skills, through prescription of adaptive aids and devices, through recommendation of appropriate modifications in the living environment, and through other educational and training strategies which address physical, psychological, or cognitive deficits interfering with the daily occupations of self-care, work, and play.

Physical Therapists specialize in problems related to movement. The more common movement disorders result from impairment of neuromuscular, musculoskeletal, respiratory or cardiovascular systems. Following assessment of their clients, they often use physical agents such as therapeutic exercise, heat, cold, and electrical stimulation to increase muscle strength and function, reduce pain, promote general health and fitness, and prevent disability. As specialists in movement dysfunction, physical therapists also provide expertise in human mobility, carefully analyzing gait patterns and prescribing treatment regimens or devices (such as braces, crutches or wheelchairs) to enable clients to move independently through their environments.

General Information

Degree programs in the School of Rehabilitation Sciences typically require four years of education beyond high school. Prerequisites, which usually require one or more years of study, may be completed at The University of British Columbia or any other accredited university or at a community college. For those admitted to the professional programs in the School, the second, third and fourth years of study for the degree are completed in the School of Rehabilitation Sciences and at affiliated health care facilities in British Columbia and across Canada. Because of the nature of the curricula, pursuit of the degrees offered by the School is normally on a full-time basis. Where any of the required courses for these programs have been completed prior to admission to the School, advance standing may be granted.

Applicants for a second degree in the School of Rehabilitation Sciences will be considered along with all other applicants to second year. If admitted for the second degree they may be given credit for core courses completed within the preceding five years.

The School of Rehabilitation Sciences

A School within the Faculty of Medicine.

The School of Rehabilitation Sciences provides professional preparation in the rehabilitation sciences, and awards the degrees of Bachelor of Science in Occupational Therapy (B.Sc. (O.T.)), Bachelor of Science in Physical Therapy (B.Sc. (P.T.)), and Master of Science (M.Sc.).

Students are reminded that the general policy of The University of British Columbia as to admission and registration will be followed.

Admission

Applications for admission to the programs in the School of Rehabilitation Sciences will be considered from candidates who meet the pre-requisite courses and minimum academic standing listed in the applicable program of study. Because of limitations in clinical placements, facilities and resources, class sizes must be restricted. Not every qualified applicant will be offered admission. Admission is based on a selection process which strives to enrol the most highly qualified applicants. Selection is based on completion of pre-requisites, academic standing, written and verbal communication skills, maturity and personal suitability. Personal characteristics are judged through interviews and letters of reference. Written communication skill is judged by performance on a timed test of competence in written English. Applicants will be allowed one attempt per application, with no appeal. Applicants will be notified if they qualify for an English test. Invitations for an interview may follow. Primary consideration is given to residents of British Columbia. Specific and up-to-date admissions procedures are described in the respective programs' *Applicant Information* handouts available from the Coordinator, Student Services.

Program in Occupational Therapy

- Pre-requisite courses — a minimum of 30 credits of university or college coursework is required, and must include:
Biology, 6 credits, BIOL 110 and 120 or 115 and 120 (or BIOL 120 alone for students with at least 80% in BIOL 12 and exemption from BIOL 110 OR 115)
English, 3 credits, (ENGL 112 recommended)
Psychology, 3-6 credits at 100- or 200-level
Sociology or Anthropology, 3-6 credits at 100- or 200-level
Statistics, 3 credits
Electives, 6-12 credits, as required to fulfill 30 credit minimum.
Recommended: Chemistry 103 or 110 or 121 and 122
- Minimum academic standing — 70% (GPA 2.8), calculated for the 30 credits of pre-requisite courses.
- References — one letter of reference is required from a person knowledgeable about the applicant's volun-

teer or work experience with people with disabilities. The letter must verify a minimum of 70 hours experience at no more than two facilities.

Program in Physical Therapy

- Pre-requisite courses — a minimum of 30 credits of university or college coursework is required, and must include:
Biology, 6 credits, BIOL 110 and 120 or 115 and 120 (or BIOL 120 alone for students with at least 80% in BIOL 12 and exemption from BIOL 110 OR 115)
Chemistry, 6 credits, CHEM 103 or 110 or 121 and 122
English, 3-6 credits, (ENGL 112 recommended)
Psychology, 3-6 credits at 100- or 200-level
Statistics, 3 credits
Electives, 3-9 credits, as required to fulfill 30 credit minimum.
- High school pre-requisite — Physics 11.
- Minimum academic standing — 70% (GPA 2.8), calculated for the 30 credits of pre-requisite courses.
- References — two letters of reference are required, one of which must be from a person knowledgeable about the applicant's volunteer or work experience with people with disabilities. The letter must verify a minimum of 70 hours experience at no more than two facilities.

Physical Fitness Requirements

Upon acceptance each applicant must present a certificate of physical fitness from a physician in accordance with the regulations of the Student Health Service.

Application Procedure and Fee

All inquiries and requests for application forms should be addressed to: Coordinator, Student Services, School of Rehabilitation Sciences, The University of British Columbia, T325, 2211 Wesbrook Mall, Vancouver, B.C. V6T 2B5. All parts of the application are to be completed and submitted to the School no later than February 28, with the single exception of final official post secondary transcripts which must be submitted no later than May 31.

An application fee of \$75 must be submitted if transcripts are from an institution outside of B.C.; or \$50 if transcripts are from an institution within B.C.

Applications received with incomplete documentation or without the correct fee will not be processed.

Costs Other Than Sessional Fee

Students should be prepared for the additional expenses required in these professional programs, including costs associated with uniforms, travel, clinical fieldwork and books. General information is available in the *Applicant Information* brochure. Specific information is available at the School for incoming students only.

Since some clinical fieldwork placements are located outside Vancouver, students should include the additional costs associated with travel, meals and accommodation for such placements in estimating total expenses. Because of the requirements for travel associated with the various levels of clinical fieldwork placements within Vancouver and the Lower Mainland, students should be prepared to arrange for convenient transportation (preferably access to a car) in order to minimize the time and effort necessary to meet their obligations for these educational experiences.

Advanced Standing

Advanced standing/exemption for required courses in the B.Sc.(O.T.) and B.Sc.(P.T.) programs is granted only with previous completion of the identical course(s) or their equivalent. Students, once admitted, must request advanced standing/exemption, in writing, to the Coordinator, Student Services, by August 15.

Attendance

- 1) Students are expected 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 Student Health Services.
- 3) If unavoidably absent for clinical placements, a student is required to notify the clinical facility and the School.

Examinations

- 1) Examinations in the School of Rehabilitation Sciences may be held at various times throughout the year. Final Examinations are normally written at the end of each academic term, and are obligatory for all students.
- 2) Absence from an end-of-term examination will normally result in a failing mark for the examination which could result in a failure for the course.
- 3) If, for reasons of health, a student is unable to attend a scheduled examination and has advised the School accordingly, the student may apply in writing to the Director for permission to sit for the examination at a later date. In such cases, permission *may* be given for the student to write a supplemental examination. Documentation from the Student Health Service or a physician certifying the nature and duration of an illness is required for students missing scheduled examinations for reasons of health.
- 4) The minimum passing mark in the School of Rehabilitation Sciences is 60%.
- 5) Essays and examination papers may be denied a passing mark if they are illegible or unacceptably deficient in English.
- 6) In any course in which evaluation includes laboratory (practical) and written course requirements, students may be required to achieve a minimum of 60% in each of the laboratory (practical) and written course re-

quirements in order to achieve a pass (60% or above) in the course.

- 7) An instructor of a course may request that the Promotions Committee grant a supplemental examination in a failed course provided that:
 - a) attendance has been satisfactory,
 - b) a mark of at least 50% has been achieved in the failed section(s) of a course,
 - c) no more than two supplementals have been granted since admission to the program, and
 - d) an average of at least 65% in the work of the year including the failed course(s) has been obtained.

The passing mark for a supplemental examination is 65%. When a supplemental exam is passed, the student's mark for the course will be recorded as a "C+" (65%).

Advancement

- 1) The Promotions Committee will determine a student's eligibility for promotion from one year to the next only when academic and fieldwork courses are complete. In order to be eligible for promotion students must pass all courses and have achieved an overall GPA of 65% in the work of the academic year just ended.
- 2) A student may repeat a course only once.
- 3) When students have been assigned a failing grade or a supplemental examination in three or more courses over the duration of the program they will be required to withdraw from the School. Students who are required to withdraw from the School under the provisions of this policy will not be permitted to apply for readmission.
- 4) Although satisfactory academic and fieldwork performance (at least 65% GPA in each year and no less than 60% in any course) are prerequisites to advancement they are not the sole criteria in the consideration of the suitability of a student for promotion or graduation. The Promotions Committee reserves the right to require a student to withdraw from the program if considered to be unsuited to proceed with the study or practice of occupational therapy or physical therapy.

Clinical Fieldwork Experience

Clinical fieldwork, in facilities which have been approved by the School of Rehabilitation Sciences and affiliated with the University, will be supervised by University appointed personnel. Clinical fieldwork in either occupational therapy or physical therapy will be provided in facilities such as hospitals, health clinics, community care agencies and rehabilitation centres. A *minimum* of one four- to eight- week clinical fieldwork experience is required to be completed outside the Greater Vancouver area. Students are responsible for all expenses involved. Students normally must achieve a passing grade in all RHSC and RSPT or RSOT academic courses that are scheduled prior to each fieldwork course.

RSPT 230/RSOT 235 (4 weeks/6 weeks) — A student who fails one or more sections of these courses or withdraws for any reason, may be granted permission to advance to Third Year only on the recommendation of the Promotions Committee. These courses are completed on a full-time basis in specified blocks of time between May and August after Second year.

RSPT 330/RSOT 335 (18 weeks/14 weeks) — A student who fails one or more sections of these courses or withdraws for any reason, may be granted permission to

advance to Fourth Year only on the recommendation of the Promotions Committee. These courses are completed on a full-time basis in specified blocks of time during the academic year (Physical Therapy only) and between May and August after Third year (both Occupational Therapy and Physical Therapy).

RSPT 430/RSOT 435 (12 weeks/14 weeks) — A student who fails one or more sections of these courses or withdraws for any reason, will not be eligible for graduation. Graduation will be delayed until all sections of these courses have been successfully completed. These courses are completed on a full-time basis in specified blocks of time during the academic year.

If a supplemental is granted in any section of a clinical fieldwork course or if a student misses a complete fieldwork experience due to accident or illness the section must be repeated and passed before a student can be eligible for graduation.

On completion of all academic courses and clinical fieldwork physical therapy graduates will be eligible for membership in the Canadian Physiotherapy Association (C.P.A.), the Physiotherapy Association of British Columbia (P.A.B.C.) and the College of Physical Therapists of B.C. Graduates from the Physical Therapy program may be required to write a National Certification Examination in order to be eligible to practise in British Columbia.

Occupational therapy graduates must complete all academic courses, clinical fieldwork requirements and pass the Canadian Association of Occupational Therapists (C.A.O.T.) Certification Examination in order to be eligible for membership in C.A.O.T. and the British Columbia Society of Occupational Therapists (B.C.S.O.T.).

Bachelor of Science in Occupational Therapy B.Sc. (O.T.)

Second Year

Course	Credits	
ANAT 390	4	Basic Human Anatomy
ANAT 392	4	Gross Anatomy of the Limbs and Trunk
BIOL 363	6	Vertebrate Physiology
PATH 375	2	Introduction to Human Pathology
RHSC 201	3	Kinesiology
RHSC 202	2	Human Development for Habilitation and Rehabilitation
RHSC 205	2	Adaptive Equipment and Techniques
RSOT 207	6	Theory and Practice
RSOT 235	2	Clinical Fieldwork
	3	Elective

By April 30 of second year all students are required to show evidence of:

- 1) a valid first aid certificate (e.g., St. John's) or equivalent competence.
- 2) a valid Basic Cardiac Life Support (BCLS) Level C certificate. In addition students will be required to show proof of current certification in BCLS Level C certificate on an annual basis prior to commencing clinical fieldwork.
- 3) completion of the medical terminology requirement. (Completion of GLST 301 at UBC exempts students from this requirement.)

Third Year

Course	Credits	
RHSC 320	4	Elements of Neuroanatomy and Neurophysiology
RHSC 301	6	Medical and Surgical Conditions
RHSC 302	3	Psychosocial Aspects of Disability

RSOT	303	4	Clinical Conditions in Psychiatry
RSOT	307	1	Psychosocial Dysfunction
RHSC	311	1	Interpersonal Communication in Rehabilitation
RSOF	312	2	Tests and Measures
RSOT	322	1	Biomechanical Treatment Approaches
RSOT	323	3	Neurorehabilitation
RSOT	335	6	Clinical Fieldwork
		3	Elective

Fourth Year

Course	Credits	
RIUSC	#02	3 Introduction to Scientific Inquiry
RHSC	#08	2 Management and Policies in Health Care
RSOT	#16	3 Vocational Rehabilitation
RSOT	#18	2 Assistive and Rehabilitation Technology
RSOT	#23	3 Neurorehabilitation
RSOT	#24	2 Program Design
RSOT	#25	1 Social and Professional Issues
RSOT	#26	3 Directed Studies, or
RSOT	#36	3 Ergonomics and Organization of Activity
RSOT	#34	3 Clinical Reasoning
RSOT	#35	7 Clinical Fieldwork

Bachelor of Science in Physical Therapy B.Sc. (P.T.)

Second Year

Course	Credits	
ANAT	390	1 Basic Human Anatomy
ANAT	392	1 Gross Anatomy of the Limbs and Trunk
BIOL	363	6 Vertebrate Physiology
PATH	375	2 Introduction to Human Pathology
RHSC	201	3 Kinesiology
RIUSC	202	2 Human Development for Habilitation and Rehabilitation
RSPT	203	2 Cardiopulmonary Clinical Skills
RHSC	205	2 Adaptive Equipment and Techniques
RSPT	206	3 Introduction to Physical Therapy Procedures
RSPT	208	3 Physical Assessment of the Musculo-skeletal System
RSPT	230	2 Clinical Fieldwork

By April 30 of second year all students are required to show evidence of:

- 1) a valid first aid certificate (e.g., St. John's) or equivalent competence.
- 2) a valid Basic Cardiac Life Support (BCLS) Level C certificate. In addition students will be required to show proof of current certification in BCLS Level C certificate on an annual basis prior to commencing clinical fieldwork.
- 3) completion of the medical terminology requirement. (Completion of CLST 301 at UBC exempts students from this requirement.)

Course	Credits	
RIUSC	#20	1 Elements of Neuroanatomy and Neurophysiology
RHSC	301	6 Medical and Surgical Conditions
RHSC	302	3 Psychosocial Aspects of Disability
RSPT	304	2 Management of the Musculoskeletal System
RSPT	305	3 Electro and Hydrotherapy
RSPT	308	2 Management of Musculoskeletal and Neuromuscular Dysfunction
RHSC	311	1 Interpersonal Communication in Rehabilitation
RSPT	313	2 Management of the Respiratory System
RSPT	314	3 Management of the Neuromuscular System
RSPT	330	9 Clinical Fieldwork
		3 Elective

Fourth Year

Course	Credits	
RHSC	#02	3 Introduction to Scientific Inquiry
RHSC	#08	2 Management and Policies in Health Care
RSPT	#11	2 Selected Topics in Physical Therapy
RSPT	#12	1 Critical Care

RSPT	#13	6 Comprehensive Patient Management
RSPT	#14	0 Social and Professional Issues
RSPT	#19	3 Exercise Physiology in Health and Disease
RSPT	#30	6 Clinical Fieldwork
RSPT	#15	1 Independent Study, or
RSPT	#11	A Manual Therapy Approach to the Assessment and Treatment of Individuals with Musculo-skeletal Dysfunctions of the Lumbar Spine and Pelvis, or
RSPT	#12	Spinal Cord Injury: Issues of Rehabilitation, or
RSPT	#13	Sports Physical Therapy, or
RSPT	#15	Management of Children with Developmental Disabilities

Graduate Studies — M.Sc. Program

The program leading to the degree Master of Science in the School of Rehabilitation Sciences is designed primarily to offer advanced study for occupational therapists and physical therapists in defined areas of rehabilitation and to prepare these practitioners to conduct, report, and critique research. Three areas of concentration are offered which will lead to advanced understanding of rehabilitation practice, including Cardiopulmonary and Motor Performance, Neuromotor and Neurological Conditions, and Chronic Illness and Disability. Study and identification of clinical problems in an area of concentration will prepare the student to investigate critical questions of importance to rehabilitation practice.

Course of Study

This program will enable the student to investigate an area of knowledge within the rehabilitation disciplines of occupational therapy or physical therapy in collaboration with one or more faculty members with particular expertise and ongoing work in the area chosen. In order to fulfill the requirements for the degree, the student must complete the course of study with a minimum of 30 credits which will include the submission and defense of a thesis. Since elective coursework from within and outside the School is encouraged, entering students must work out a plan of study with an adviser. This plan must be approved by the student's adviser and/or Head, Division of Graduate Studies before elective coursework is begun. Study may occur on a part- or full-time basis. Students applying for full-time study should expect to spend twenty-four months completing coursework and thesis requirements.

Admission

Minimum admission requirements include a degree in occupational therapy or physical therapy, or a related rehabilitation profession, an academic record which meets the requirements of the Faculty of Graduate Studies, and completion of an introductory course in research methods and statistics. Preference will be given to applicants who hold degrees in occupational or physical therapy, are qualified to practice their rehabilitation profession in British Columbia, and who have had recent clinical experience providing rehabilitation services. For further information, see the Graduate Studies section of the *Calendar* or write: Graduate Admissions, School of Rehabilitation Sciences, T325, 2211 Wesbrook Mall, Vancouver, B.C., V6T 2B5.

Academic Staff

- ANGELO BELCASTRO, B.A., B.Sc. (McM.), M.Sc. (Dal.), Ph.D. (Alta.), Professor and Director.
- SUSAN R. HARRIS, B.S. (P.T.), M.Ed., Ph.D. (Wash.), Professor.
- ELIZABETH DEAN, B.A., Dip. (P.T.) (Manit.), M.Sc. (S.Calif.), Ph.D. (Manit.), Associate Professor.
- LYN JONGBLOED, Dip. (O.T.) (S.A.), B.Sc. (O.T.) (W.Ont.), M.A., Ph.D. (Brit. Col.), Associate Professor.
- ISABEL DYCK, Dip. (O.T.), England, B.A., M.A. (Manc.), Ph.D. (S.Fraser), Assistant Professor.
- W. DARLENE REID, B.M.R. (P.T.) (Manit.), Ph.D. (Brit. Col.), Assistant Professor.
- CATHERINE BACKMAN, B.S.R. (Brit. Col.), M.S. (Wash.), Senior Instructor.
- CHRISTINE CARPENTER, Dip. (P.T.), England, B.A., M.A. (Brit. Col.), Senior Instructor.
- MARGARET MCCUAIG, B.S.R. (Brit. Col.), M.A. (S.Calif.), Senior Instructor.
- SUSAN J. STANTON, Dip. (O.T.), New Zealand, B.S.R. (O.T.), M.A. (Brit. Col.), Senior Instructor.
- MELINDA SUTO, B.S. (O.T.) (San Jose), M.A. (S.Calif.), Senior Instructor.
- SUSAN J. FORWELL, B.Sc. (O.T.) (W.Ont.), M.A. (S.Calif.), Instructor.
- BEVERLEY LUNDGREN, B.P.T. (Manit.), Instructor (part-time).
- Associate Members**
- HUGH ANTON, Clinical Assistant Professor, Medicine.
- ROBERT W. ARMSTRONG, Associate Professor, Paediatrics.
- B. LYNN BEATTIE, Professor, Medicine.
- ANDREW CHALMERS, Associate Professor, Medicine.
- STANLEY A. HASHIMOTO, Clinical Professor, Medicine.
- HOLLY A. TUOKKO, Clinical Associate Professor, Psychiatry.
- Clinical Associate Professors**
- R. J. ANSON, Dip. (O.T.), England, B.S.R. (O.T.) (Brit. Col.).
- R. CORBETT, B.S.R. (Brit. Col.).
- G. FEARING, B.S. (O.T.) (Kansas).
- S. LOWE, Dip. (P.T.), B.Sc. (P.T.) (McG.).
- L. McCLOY, Dip. (P.&O.T.) (Tor.), B.A. (Brit. Col.).
- Clinical Assistant Professors**
- L. BAINBRIDGE, Dip. (P.T.), England, B.S.R. (P.T.) (Brit. Col.).
- P. S. BROOKMAN, Dip. (P.T.), England.
- M. BOZZER, B.S.R. (Brit. Col.).
- S. BRESSLER, B.O.T. (McG.).
- C. BUSBY, B.Sc. (O.T.) (Tor.).
- K. CAJSAFERRI, B.S.R. (O.T.), M.Sc. (Brit. Col.).
- M. J. CLARK, B.Sc. (O.T.) (W.Ont.).
- D. DACHSEL, B.S.R. (O.T.), M.Sc. (Brit. Col.).
- S. JORDEN, B.S.R. (Brit. Col.), M.B.A., Washington.
- S. LAUGHLIN, B.S.R. (Brit. Col.).
- S. R. MANNELL, Dip. (P.T.), England.
- A. M. MCGINITY, B.S.R. (O.T.), M.A. (Brit. Col.).
- M. O'BRIEN, Dip. (P.T.), England.
- J. RIHILA, B.S.R. (Brit. Col.).
- B. ROBINSON, Dip. (O.T.), B.Sc. (O.T.) (Alta.).
- H. RUMBLE, B.Sc. (P.T.) (McG.).
- J. SCHOONDERWOERT, Dip. (O.T.), England.
- L. J. STAN, B.S.R., M.Ed. (Brit. Col.), Ed.D. (Brigham Young).
- S. STEWART, Dip. (O.T.), England.
- P. STRAATHOF, B.S.R. (Brit. Col.).
- B. ten HOOPE, B.S.R. (Brit. Col.).
- Y. TOPE, Dip. (O.T.), England.
- K. M. van der HOOP, B.S.R., M.Sc. (Brit. Col.).
- T. A. WHITE, B.S.O.T. (Wayne State).
- Clinical Instructors**
- P. J. ABBOTT, B.P.E., B.Sc. (O.T.) (Alta.).
- A. ANSON, B.S.R. (Brit. Col.).
- D. ARSENAULT, B.S.R. (Brit. Col.).
- E. AUBERT, Dip. (P.T.), England.
- B. BARR, Dip. (P.&O.T.) (Tor.), B.P.T. (Manit.).
- G. BARTHOLOMEW, Dip. (P.T.), England.
- C. BETUZZI, B.S.R. (Brit. Col.).
- G. R. BEVERLEY, Dip. (P.T.), England.
- A. BREMNER, Dip. (P.&O.T.) (Tor.), B.S.R. (O.T.) (Brit. Col.).
- R. BURNLEM, Dip. (P.T.), England.
- P. BUSTAMANTE, B.O.T. (Chile).
- A. BUTTERFIELD, Dip. (P.T.), England.
- N. CHADWICK, B.Sc. (O.T.) (Tor.).
- M. CHANNA, B.Sc. (O.T.) (Nagun Med. Coll.), B.Sc. (Raipur).
- M. M. CLARK, Dip. (P.T.), New Zealand.
- J. A. CONNORS, Dip. (P.&O.T.) (Tor.).
- J. DAVIS, B.S.R. (Brit. Col.).
- R. den OTTER, Dip. (O.T.), B.Sc. (O.T.) (Alta.).
- B. E. DESJARDINS, B.Sc. (P.T.) (Tor.).
- V. DICK, Dip. (O.T.), England.
- A. DRAPER, B.S.R. (Brit. Col.), B.Sc. (S.Fraser).
- G. EBERT, Dip. (P.T.), (Alta.).
- S. B. FLEMING, Dip. (P.T.), England, B.Sc. (Alta.).
- J. GATES, Dip. (P.T.) (Manit.).

J. GAITHER, B.Sc., B.S.R. (Brit. Col.).
 J. GODFREY, Dip. (O.T.), England.
 R. GOODMAN, B.Sc. (P.T.) (Ind.).
 B. GORDON, Dip. (O.T.) (Manit.).
 R. C. GROVES, B.S.R. (Brit. Col.).
 K. HAMBLETT, B.Sc. (O.T.) (Minn.).
 J. M. HARRIS, B.Sc. (O.T.) (Queen's).
 R. J. HENRY, Dip. (P.T.), B.Sc. (P.T.) (Alta.).
 H. HERMANS, B.S.A. (Brit. Col.), B.S. (P.E.) (Wash.).
 P. HICKS, B.Sc. (P.T.), Australia.
 E. HOUGHTON, B.S.R. (Brit. Col.).
 S. HOWICK, B.S.R. (Brit. Col.).
 B. HUDSON, B.Sc. (P.T.) (McG.).
 M. JOHNSTON, Dip. (P.T.), Ireland.
 K. JUNAD, Dip. (P.T.), England, B.S.R. (Brit. Col.).
 S. KENWORTHY, B.S.R. (Brit. Col.).
 M. M. KIRKHOPE, Dip. (P.T.), England.
 M. KONKIN, B.M.R. (O.T.) (Manit.).
 M. LEDOYEN, B.P.T. (Manit.).
 J. LETKEMEN, B.M.R. (P.T.) (Manit.).
 P. LIEBLICH, B.P.T. (McG.).
 L. T. LLOYD, Dip. (P.T.), England.
 J. LUNDIE, B.M.R. (P.T.) (Manit.).
 H. MacINNIS, B.Sc. (O.T.) (East. Mich.).
 D. MAHONES, B.Sc. (O.T.) (Alta.).
 Y. J. MANSFIELD, B.S.R. (Brit. Col.).
 A. M. MICHAEL, Dip. (P.T.), England.
 B. McCONNELL, Dip. (P&O.T.) (Tor.), B.O.T. (Manit.).
 B. McNAIR, B.Sc. (O.T.) (Alta.).
 J. MILLARD, Dip. (O.T.), England, B.S.R. (O.T.) (Brit. Col.).
 K. A. MILLS, B.A., B.Sc. (O.T.) (W. Ont.).
 I. G. MONTGOMERY, B.Sc. (P.T.) (Brit. Col.).
 J. P. MOSCOWITZ, B.O.T. (McG.).
 S. MURPHY, Dip. (P.T.) England.
 S. NELSON, B.A. (Leam.), Dip. (O.T.), Glasgow.
 S. PEARL, Dip. (P.T.) (Alta.).
 F. PHILSWORTH, Dip. (P.T.), England.
 R. PORTER, B.S.R. (Brit. Col.).
 J. PURVES, B.S.R. (Brit. Col.).
 J. RALDMAN, Dip. (O.T.), England.
 J. R. REIMER-CLARKE, B.Sc. (P.T.) (Alta.).
 J. ROTTLEDGE, B.A. (Colorado), B.S.O.T. (Poget Sound).
 J. ROXBOROUGH, B.S.R. (Brit. Col.).
 C. SERMIE, Dip. (P.T.), England.
 J. SHORREED, B.Sc. (O.T.) (Queen's), M.F.P. (W. Ont.).
 K. SKAPINS, B.S.R. (Brit. Col.).
 C. STEINMAN, B.Sc., B.S.R. (Brit. Col.).
 J. SPEACE, B.S.R. (Brit. Col.).
 B. STODOL, B.A. (Brit. Col.), Dip. (O.T.), Kingston.
 C. A. TAIT, Dip. (P&O.T.) (Tor.).
 J. TAMBOL, Dip. (P.T.), New Zealand.
 C. T. THOMSON, B.S.R. (Brit. Col.).
 F. THOMPSON, B.A. (Brit. Col.), Dip. (O.T.).
 J. E. TURNER, B.S.R. (Brit. Col.).
 F. VAN CUTTERS, Dip. (P.T.), England.
 K. VARMA, Dip. (P.T.), Australia.
 F. VARRONA, B.S.P.T., Philippines.
 A. VOGL, B.Sc., B.Sc. (P.T.) (Tor.).
 M. WALLACE, B.Sc. (P.T.) (Brit. Col.).
 R. WARICK, M.A., M.Ed. (Regina).
 H. WHITE, Dip. (P.T.), Australia.
 E. E. WHIS, Dip. (P.T.), Ireland, B.S.R. (P.T.) (Brit. Col.).

1995-96

Bachelor of Science B.Sc.

To earn a B.Sc. degree students must follow one of the following programs:

- **Honours** – This program usually involves intense specialization in a single field or combination of fields, and is the normal route to graduate study. The Honours program in Environmental Sciences is more broadly based and is not intended as preparation for graduate study in a specific discipline without additional qualifying studies. An Honours program requires maintenance of a high academic standing and may involve preparation of a graduating thesis.
- **Major** – This program involves specialization in a single field or a combination of fields. It may lead to graduate study if sufficiently high standing is obtained.
- **General** – This program provides a broad education in science, with the opportunity for some specialization in either one or two of the following areas: Chemistry, Earth Science, Life Science, Mathematical Science and Physics. This program is appropriate and useful for those going on in other professional areas, such as Dentistry, Law, Medicine or Veterinary Medicine. The General Science route that requires concentrations in two areas, provides excellent preparation for prospective secondary school teachers. This program is not normally intended for students planning to continue with graduate study in science. However, with careful planning and sufficiently high standing it is possible to go on to graduate study, but this may require additional qualifying studies at some universities.
- **Minor** – An optional Minor program comprising courses taken in another Faculty may be completed as part of a B.Sc. degree only in conjunction with a Major program in Science. The Minor allows students to focus their non-Science electives in a single subject or field of specialisation. A Minor **must** be completed in a subject or field other than one offered in the Faculty of Science.
- **Part-time Program** – Some degree programs are amenable to part-time study. Students should inquire at the Office of the Dean for further information and direction in arranging a part-time study program.

Admission

Apart from the usual university entrance requirements (see General Information section) students from Grade 12, British Columbia, are required to have completed satisfactorily Chemistry 11, Mathematics 11 and 12, Physics 11 and one of: Biology 12, Chemistry 12, Computer Science 12, Geology 12, or Physics 12. Other courses should be chosen from: Biology 11, 12, Chemistry 12, Computer Studies 11, Computer Science 12, Earth Science 11, Geology 11, 12, and Physics 12. Students may find it to their advantage to present credit for as many of Biology 12, Chemistry 12 and Physics 12 as possible. Certain programs have reduced requirements in one or more of these subjects for students with Grade 12 credit. For information about advanced placement or advanced credit for courses taken in the International Baccalaureate or Advanced Placement programs, consult the UBC Admissions Guide or the Registrar's Office (Admissions). A standing of "C+" or better in Mathematics 12 (or equivalent) is required for admission to the Faculty of Science directly from secondary school. Students admitted to the Faculty of Science by transfer from other post-secondary institutions must present credit for Mathemat-

The Faculty of Science

The B.Sc. degree can be earned in the following fields:

- Aquacultural Science
- Astronomy
- Atmospheric Science
- Biochemistry
- Biology
- Chemistry
- Climatology
- Computer Science
- Environmental Sciences
- General Science
- Geology
- Geophysics
- Mathematics
- Microbiology
- Nutritional Sciences
- Oceanography
- Pharmacology
- Physical Geography
- Physics
- Physiology
- Psychology
- Statistics

A Diploma in Meteorology is also offered by the Faculty of Science (see entry following Atmospheric Science degree).

For information about the M.Sc. and Ph.D. degrees see the Faculty of Graduate Studies section of the *Calendar*.

ics 100 (or equivalent) and, **effective September 1996**, must either have met the English Requirement of the Faculty of Science or be eligible to enrol in first-year English at the time of admission. (See English Requirement below.)

Applicants who cannot meet the requirements exactly as specified should submit a special appeal to the Registrar's Office with their application forms. The Dean, who has discretionary powers on admissions, will consider all appeals.

All new applicants to the University must pay a \$20 (Canadian) Application Processing Fee at the time of their initial application.

Students with educational documents issued outside the Province of British Columbia must pay an additional evaluation fee of \$30 (Canadian). Students applying for admission from Secondary Schools outside the Province must meet the minimum requirements applied to graduates from British Columbia Secondary Schools for admission to Year Level 1. A student required to discontinue from another Faculty may be permitted to register only by special permission, and should consult the Office of the Dean. A student with unsatisfactory standing from another post-secondary institution will not be admitted.

Registration and Program Approval

New requirements for all B.Sc. Major programs came into effect for the 1994/95 academic year and thereafter. Students in second year in 1995/96 **must** follow the new regulations given in this *Calendar*. Students in third or fourth year may elect to follow either the new or the old requirements. Students in third year in 1995/96 are encouraged to follow the new requirements. Fourth year students in 1995/96 should generally follow the old requirements. The old requirements may be found in the 1993/94 edition of the *Calendar*.

The following is only a summary of the registration procedures for Science students. Complete information may be obtained from the material mailed to the students with their Letter of Acceptance (new students) or Statement of Grades (returning students).

- **First-year students** – First-year students are not required to choose a program or specialization or to obtain program approval before registering through TELEREG. Students must be careful, however, to select courses appropriate to the program they plan to enter in Second year. Refer to the section below, First Year Requirements. Students should seek advice from the Office of the Dean of Science if their First-year program is nonstandard because of advanced placement or transfer credit.

First-year students wishing to enrol in Science One must submit a formal application for admission to this course of study to the Director of Science One by April 30. Refer to the Science One description under First-Year Requirements in this section of the *Calendar*.

- **Second, Third and Fourth-year students** – Students entering second and subsequent years must select a major (or major plus minor), honours, or general program as outlined by the Faculty of Science. **Unless students are registered in a specific program their academic records cannot be adjudicated for graduation.** Program specialization codes are provided with the description of the program requirements. Students not meeting the academic standing required for compulsory courses in a given program may be required to withdraw from that program. In many instances changes from one program to another are possible in later years. Changes in program may result in lengthening the time to complete the B.Sc. degree. Returning students are advised to obtain program advice before the end of the second term. All study programs are subject to approval by the

Department(s) concerned. With the approval of the Dean of the Faculty of Science, Departments may require, as a prerequisite for entering a program, that a student obtain at least 60% in a specified first-year course basic to the field of the major, unless special permission is received from the Head of the Department.

- **All years** – After two weeks of lectures, except in very special circumstances and with the permission of the Dean, students (whether full-time or part-time), may not change the program for which they are registered. After the close of TELEREG, all changes in course registration must be made by students applying at the office of the Dean of Science. Program changes must be approved by the Head(s) of the Department(s) concerned and by the Dean's office. These changes are processed by the Dean's office. Students may not take courses for which they have not registered, and may be considered as having failed in all courses dropped without permission.

Examinations

Formal written examinations (scheduled by the Registrar) are required at the end of all courses terminating in December or in April, and also in December for courses continuing all year. The formal written examination may be replaced by alternative examination procedures only at the discretion of the Head of the Department and with the permission of the Dean.

Note: Supplemental examinations are not offered in any courses in the Faculty of Science.

Passing the final examination may not in itself be sufficient to pass a given course. Students may be denied a passing grade for unsatisfactory work during the session or if their essays, laboratory reports or examination papers are deficient in English. Furthermore, in any Science course which has both laboratory work and written examinations, **students must complete and pass both parts to pass the course.** A student who fails the laboratory work may not be allowed to sit for the final written examination.

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 from the final examinations.

In general students who pass a course can use it as a prerequisite for a subsequent course in that subject. However, departments do have the right to bar entrance to their third year courses to students who obtain only a minimum passing grade in their second year prerequisite course or courses. Students should request permission from the Dean to write the next regularly scheduled examination in a course for higher standing if it is necessary for them to use the course as a prerequisite. The overall average for a session or for a degree will remain unchanged and **will not** be recalculated based on subject(s) already passed and written for higher standing. Examinations for higher standing are assessed the same fees as those imposed for supplemental examinations (see under "Fees, Special Fees" in the General Information section of the *Calendar*).

No failed course may be repeated more than once without special permission of the Dean. This does not apply to courses in first-year English, which may be repeated twice.

Limitation of Enrolment

It may be necessary to limit enrolment in certain courses in the Faculty of Science when the demand for these courses is greater than the resources available. Where limitations in enrolments become necessary, the criteria for implementation will normally be determined by academic considerations as suggested by the Head of the Department and approved by the Dean.

Note: A student who has passed a course will be permitted to repeat that course for higher standing only if space is available and only with special permission of the Head (or designate) of the Department concerned and of the Dean.

Credit

The normal pattern for a full-time student is to take 30 credits per winter session. After four winter sessions the student with 120 credits usually earns a B.Sc. degree. A full-time student normally must complete Graduation Requirements within seven calendar years following admission to Year Level 1 or its equivalent.

First year students at this University or students transferring to this University from another Institution must request permission from the Dean's Office in order to register for more than 30 credits. No student may take more than 36 credits per winter session without special permission of the Dean. Students who fail a course in one winter session will not be allowed to attempt more than 30 credits in their next winter session, except with special permission of the Dean.

Part-time students are urged to complete Graduation Requirements in a reasonably short time to avoid complications resulting from program changes, or from substantial changes in course material, or from both.

For some courses in the International Baccalaureate and Advanced Placement enriched secondary school programs, exemption and/or credit may be granted. This will be noted on a student's notification of acceptance to UBC. Such students are advised to consult departmental advisers at UBC before registering in any Second Year level courses. Prospective UBC students who have completed or are registered in a secondary school calculus course should consult the statement "Credit for Secondary School Calculus Courses" that appears in the Admissions Section of the *Calendar*.

Students transferring to the Faculty of Science from other Faculties at the University of British Columbia must consult the Dean regarding transfer of credits to the B.Sc. degree.

Summer Session Credit

This may be combined with Winter Session credit in a degree program with the approval of the Department or Faculty adviser. These courses do not count as part of the full-time program in a Winter Session. Note that the maximum credit for any Summer Session is 12 credits, except with the permission of the Dean. It is not possible to take two laboratory science courses in the same Summer Session.

Academic Concession

Students whose academic performance or attendance is severely affected by medical, emotional, or other problems, and who are seeking special consideration, must apply for such consideration through the Office of the Dean of Science. They will be required to complete a "Request for Academic Concession" form and provide the necessary supporting documentation.

If students are absent from an end of term (for full year courses) or a final examination in December, they must submit a request for academic concession with accompanying documentation by January 15 immediately following; if absent from a final examination in April, students must submit a request for academic concession with accompanying documentation by May 15 immediately following. Untimely notification normally will not be accepted.

Note: Academic concessions are a privilege, not a right, and are granted only by the Dean of the Faculty or designate.

Among the academic concessions that may be granted are Aegrotat Standing, Deferred Standing and withdrawal from the University. For further information, refer to the headings "Grading Practices", "Withdrawal" and "Academic Concessions" in the General Information Section of the *Calendar*.

Faculty Requirements

General Graduation Requirements

An Honours program requires 132 credits. A Major or General program requires 120 credits. A Minor program comprising courses in another Faculty may be completed toward a B.Sc. degree only in conjunction with a Major program in Science and requires at least 18 credits of courses numbered 300 and higher in a single subject or field of specialisation.

Students are responsible for selecting a program that meets all the faculty and departmental requirements. Students who have interrupted their studies may find that requirements have changed since the period of their previous enrolment. They must consult the Dean and the Department involved.

Students currently registered at UBC may **not** take courses for credit toward the B.Sc. at another institution without prior written permission from the Office of the Dean. The Faculty has no obligation to grant transfer credit unless a Letter of Permission has been obtained. It is the student's responsibility to see that an official transcript is forwarded to Admissions, Registrar's Office.

English Requirement

To qualify for the degree of B.Sc. students must satisfy the English Requirement of the Faculty of Science. To do this students must obtain credit for two of English 110, 111, 112, 120 and 121, or their equivalents if taken at another institution. English 112 is recommended. Qualified students are encouraged to consider English 120 and/or 121.

All students admitted to the B.Sc. program must take immediate steps to satisfy the English requirement.

Notes

- 1) Students admitted directly from secondary school are required to take English in their first year if eligible to do so. To be eligible, students must have written the Language Proficiency Index (LPI) examination and obtained a score of level 5. For details on this examination, and exemptions from it, see "Language Proficiency Index (LPI) Requirement for First-Year English" in the Admissions section of the *Calendar*.
- 2) Students admitted directly from secondary school who have not obtained a score of level 5 on the LPI will be permitted to register in no more than 12 credits of course work per term until a satisfactory LPI score is achieved. Students unable to enrol in a first-year English course because of an unsatisfactory LPI score

- are advised to take a non-credit writing course through the University Writing Skills Centre.
- 3) Students who do not achieve a level 5 LPI score before completing 30 credits toward the B.Sc. degree will not be permitted to register in any additional credit courses until they obtain a level 5 score on the LPI examination.
 - 4) Effective September 1996, students seeking admission to the B.Sc. program on transfer from another post-secondary institution, or readmission after being required to discontinue, must have met the English requirement, or if not, be eligible to enrol in first-year English at the time of admission or readmission (i.e., must have obtained a score of level 5 on the LPI).
 - 5) Students who have not met the English Requirement by the time they have completed 60 credits of course work toward the B.Sc. degree, taken either at UBC or at another post-secondary institution, will not be permitted to enrol in courses other than first-year English until the English Requirement is met.
 - 6) Once admitted to UBC students will not normally be permitted to satisfy the English Requirement at another institution.

Science Requirement

At least 72 credits must be in Science courses. Geography courses designated as carrying Science credit are numbered 00-09 in the last digits, plus Geography 372, 373, and 472. (Geography 449 also carries Science Credit, but only for B.Sc. Honours students in Geography.) In addition to Psychology 348 and 448, all Psychology courses numbered 60 or above in the last two digits have Science credit. Only the following courses in the Faculty of Agricultural Sciences have Science credit: ANSC 321, 322, 323 and 425; HUNU 305, 307, 309 and 409.

Arts Requirement

At least 18 credits must be in Arts courses, which must include six credits of first-year English and at least 12 other credits in Arts courses that are for credit toward the B.A. degree. Students in first-year Science are restricted to Arts courses numbered 100 to 199 for which they have the appropriate prerequisite. Certain language courses numbered 200 or higher, listed under Program Requirements in the Faculty of Arts section of the *Calendar*, are also permissible.

The following courses offered by the Faculty of Arts may not be used to satisfy the Arts requirement, but may be taken for "other credit": all performance, studio and technique courses in the Department of Fine Arts, the Department of Theatre and Film and the School of Music; all other courses in Arts that are not for credit toward the B.A. degree.

The Arts requirement can be met by Geography courses numbered 20 and above in the last two digits except those numbered 40-48 and 70-79 in the last two digits. Courses in the School of Family and Nutritional Sciences designated FMSC may be used to satisfy the Arts requirement; courses designated HMEC and HUNU may not.

Upper-level Requirement

At least 48 credits of Arts and Science studies must be in courses numbered 300 or higher, and of these, at least 30 credits must be in Science courses. Except for Geography 372, 373 and 472, which have Science credit, Geography courses numbered 10-19, 40-48, 70-79 in the last two digits are not designated as either Science or Arts and may not be included in the minimum 72 credits of Science and 18 credits of Arts required by the B.Sc. program. They may, however, be included, with due regard to prerequi-

sites, in the required 48 credits of courses in Arts and Sciences numbered 300 or higher. Environmental Studies 200, 300 and 400 are not designated as either Arts or Science and may not be included in the above minimum credits required in these two areas for the B.Sc. degree. Environmental Studies 300 and 400 may however be included in the required 48 credits of courses in Arts and Science numbered 300 or higher.

Students who successfully **complete** the Minor in Commerce may include up to 12 credits of Commerce courses numbered 300 or higher toward satisfying the upper-level requirement; other students taking Commerce courses may not.

Other Credit

Up to six credits of course work may be taken for credit toward the B.Sc. degree in a Faculty other than Arts or Science, or in those courses in the Faculty of Arts excluded from Arts credit. Students should note that these courses may not replace specific courses in a Science program or count toward the 72 credits of Science and the 18 credits of Arts courses required by the B.Sc. program. Furthermore, courses for Other Credit may not be included in the 30 credits of Science or the 48 credits of Arts and Science numbered 300 and above.

An exception is made for students who successfully complete the Minor in Commerce. They may include up to 12 credits of Commerce courses numbered 300 or higher toward satisfying the upper-level requirement, although these courses will count as Other Credit and may not replace any part of the Arts and Science requirements.

Transfer Credit

Students who are accepted by transfer from other institutions must present credit for Mathematics 100 (or equivalent) and, **effective September 1996**, must either have met the English Requirement or be eligible to enrol in first-year English at the time of admission.

The University will not grant a degree for studies that represent less than the equivalent of two regular winter sessions (60 credits). In general transfer credit is limited to the first two years (60 credits) of a degree program, wherever those credits were completed.

Credit at a more senior level is possible if prior written permission has been obtained from the Dean of Science. Under no circumstances will a student be granted transfer credit for more than 12 credits of upper-level course work. Furthermore, although transfer credit allowed by the Dean may be included in the required 48 credits of Arts or Science numbered 300 or above, a B.Sc. program must include a minimum of 30 credits of upper-level UBC Science courses specified by the Major or Honours program.

Students enrolled in UBC degree completion programs at **Okanagan University College** and **University College of the Cariboo** enjoy special status. Such students may transfer up to a maximum of 90 credits should they wish to complete their degree program at UBC. Of the 300- and 400-level courses applicable to any particular Major or Honours program, at least 15 credits of such courses must be completed at UBC. All UBC departmental requirements regarding Major and Honours programs must also be met.

First Year Requirements

Every First Year student, unless enrolled in Science One, must take (or have advance credit or placement in):

- 1) Mathematics 100 and 101 (or 120 and 121)

- 2) Two of: English 110, 111, 112, 120, 121 (112 recommended; one of these may be deferred to second year. See Note 1.)
- 3) Chemistry 110 or 121 (See Note 1)
- 4) Physics 100 and 101, or 101, or 121 (See Note 1) **and**
- 5) Additional courses to a total of 30 credits chosen from:

Astronomy 101 (See Note 7)

Biology 110 or 115, and 120; or 120 alone for students with at least 80% in Biology 12

Chemistry 122

Computer Science 124, 126 (122, 128)

Earth Science 100

Geography 101 or 102 and/or 103

Geology 100

Geophysics 120

Math 221 or 223

Physics 102 or 122 (See Note 2)

Arts Electives (which may include the second first-year English course) chosen from Faculty of Arts courses numbered 100 - 199 for which students have the appropriate prerequisite. Certain language courses numbered 200 or higher, listed under Program Requirements in the Faculty of Arts section of the *Calendar*, are also permissible.

Notes

- 1) Students with Grade 12 credit in either Chemistry or Physics may defer that subject until Second Year, unless their program specifically requires it in First Year. However, no more than six credits in total of first-year Chemistry, English and Physics may be deferred. Students who choose to defer any Faculty requirements in these three areas must maintain registration in courses leading to the fulfilment of these requirements in Second Year and in each subsequent registration in the Faculty until the requirements are met. (See Promotion Requirements below.)
- 2) All Major and Honours programs require one or more courses from the list in 5) above. The intended program of study should be consulted to ensure the correct choice of courses. Students who are uncertain of their intended Major or Honours program should choose electives so as to provide maximum flexibility in their choice of program in Second Year.
- 3) Students who intend to pursue an Honours program are reminded that a number of Departments offer enriched first-year courses as a foundation for such programs, e.g., Biology 120, Mathematics 120/121, Physics 121/122, special sections of Chemistry 121/122.
- 4) Students intending to enter Applied Science, Commerce, Forestry, Pharmaceutical Sciences, or Rehabilitation Sciences should consult the *Calendar* for entrance requirements. These requirements must of course be included within the normal program in the Faculty of Science.
- 5) Students intending to do graduate work in the Sciences are reminded that competence in the reading of scientific literature in one or two languages other than English is sometimes required.
- 6) Advance credit or placement may be granted where appropriate when the equivalent of any or all of these courses is completed at another institution prior to admission to the University.
- 7) This course is not prerequisite to any other course.

Science One Program

Science One is a 21-credit program of study spanning two terms, with nine credits in the first term and 12 credits in the second. The program is multidisciplinary and integrates the essential material of first-year Biology, Chemistry, Mathematics and Physics through lectures, tutorials and laboratories. The aim of the curriculum is to provide a coherent focus for the student's first-year science studies, and a sense of being a member in a community of learners.

Prerequisites for enrolment in Science One are marks of B or better in each of Biology 12, Chemistry 12, Mathematics 12 and Physics 12, plus **either** a mark of A in English 12 or English Literature 12 **or** a satisfactory score (level 5 or better) on the Language Proficiency Index (LPI) examination. Students who are unable to satisfy the requirement for Biology 12 but who are otherwise qualified should submit an explanatory letter from their secondary school Principal or Counsellor with their application for admission to Science One. Enrolment is limited.

Students enrolled in Science One are required to register for an additional six credits (including three credits of first-year English) in the first term and three credits in the second term. With proper choice of electives, this satisfies prerequisite requirements for entry into all second-year programs in the Faculty of Science. Science electives for the Science One program are:

Computer Science 124, 126 (122, 128)

Earth Science 100

Geography 101 or 102 and/or 103

Geology 100

Geophysics 120

Mathematics 221 or 223

Arts electives (which may include one additional first-year English course) are chosen from Faculty of Arts courses numbered 100-199 for which students have the appropriate prerequisite. Certain language courses numbered 200 or higher, listed under Program Requirements in the Faculty of Arts section of the *Calendar*, as well as Psychology 201 to 204, are also permissible.

Students who enrol in Science One are expected to remain in the program for the complete session, but they may drop it without penalty during the period officially allowed for course changes. On successful completion of Science One, students are promoted to second-year standing in the Faculty of Science.

Information about Science One and applications for admission to this program of study can be obtained from the Science One Office, 6356 Agricultural Road, Vancouver, B.C., V6T 1Z2. The deadline for receipt of completed applications for admission to Science One is April 30.

Second, Third and Fourth Year Requirements

- **Honours Program** – Full-time students must consult the Head of the Department at the beginning of the Second Year and each subsequent year, since permission to enter an Honours program or to remain in an Honours program must be obtained from the Head of the Department(s) concerned before registration each year. Students in Environmental Sciences Honours must consult the Program Director. In addition to meeting the specific department course requirements as described in the *Calendar*, Honours candidates must complete 30 credits with a minimum overall 68% average in each academic year. Honours candidates are expected to complete the degree requirements

within five academic years measured from the date of first registration, at a University or regional college. Honours students may, with the permission of the Department(s) concerned and the Dean, interrupt their studies for a period of one year. The Honours program is available, in certain degree programs, to part-time students only with permission of the Dean.

- **Major Program** – Students who have questions about their program requirements should select courses in consultation with the departmental advisers at the beginning of the Second year and each subsequent year.
 - Note:** Of the elective credits available in Second, Third and Fourth Years, at least nine credits must be in Science electives outside the field of the Major, or in Arts; the remaining electives may be selected from any courses in Arts or in Science, including the field of the Major.
- **Minor Program** – Students intending to embark on a Minor program should refer to the statement *Minor Programs* below. All Minor programs must be approved by a Senior Faculty Adviser.
- **General Science Program** – Students in the General Program who have completed the First year should select courses in consultation with an adviser in the Office of the Dean at the beginning of the Second year and each subsequent year, if questions arise as to program requirements.
- **Part-time Program** – Students should select courses and programs in consultation with the Departmental advisers and Office of the Dean prior to the winter session each year.

Promotion Requirements

- **Promotion to Year Level 2** – Successful completion of a total of 18 or more credits, of which 12 or more must be from Science credits of Year Level 1; or successful completion of Science One. (See Note 1)
- **Promotion to Year Level 3** – Successful completion of a total of 48 or more credits which must include six credits of first-year English, 12 required Science credits of Year Level 1 (Chemistry 110 or 121; Mathematics 100 and 101 (or 120 and 121), Physics 101 or 121; or advanced placement in these requirements), and at least 18 additional Science credits. (See Note 2)
- **Promotion to Year Level 4** – Successful completion of a total of 78 or more credits of which 50 or more must be Science credits.

Notes

- 1) A student who does not meet the Minimum Requirements for Promotion to Year Level 2 within a maximum of 60 credits of course work attempted will be required to withdraw from the Faculty of Science.
- 2) A student who does not meet the Minimum Requirements for Promotion to Year Level 3 within a maximum of 90 credits attempted will be required to withdraw from the Faculty of Science.
- 3) A student who does not meet the Graduation Requirements for the B.Sc. degree within a maximum of 180 credits of course work attempted, will be required to withdraw from the Faculty of Science.
- 4) Students applying for admission to Year Levels 2 and 3 from British Columbia Colleges and Universities or from institutions outside the Province must meet, in addition to the present University admission requirements, the Faculty of Science Minimum Requirements as applied to UBC students for promotion to that stage.

Student Academic Performance

Science Scholar

The top 20 students entering each of the Third and Fourth Years will receive the notation "Science Scholar" on their records. A full 30-credit program must have been carried in order to receive this designation.

Dean's Honour List

Graduating students and students promoted to Second, Third or Fourth Year, with a standing of "A-" (80.0%) or better in the previous year, will receive the notation "Dean's Honour List" on their records. A full 30-credit program must have been carried in order to receive this designation.

Graduation Standing

In an Honours Program the categories of degree are Class 1 and Class 2, calculated on the basis of a minimum of 42 credits of courses, numbered 300 or above, designated as part of the program by the Department, and approved by the Dean.

In a Major Program the categories of degree are Class 1, Class 2 and Pass, calculated on the basis of a minimum of 30 credits of courses, numbered 300 or above, designated as part of the program by the Department, and approved by the Dean.

In the General Science Program the categories of degree are Class 1, Class 2 and Pass, calculated on the required work of the Third and Fourth Years including a minimum of 30 credits of courses numbered 300 or higher.

Failed Standing

Failed standing in a session will be assigned if a student does not meet the following conditions:

- passes in 30 credits, or all credits attempted (if fewer); **or**
- if taking more than 12 credits, passes in at least three-fifths of them and obtains an overall average of at least 60% in three-fifths of the credits taken; **or**
- if taking 12 or fewer credits, passes in at least one-half of them, with at least a 60% average in the credits passed.

Required to Discontinue

Students who do not achieve a level 5 LPI score before completing 30 credits toward the B.Sc. degree will not be permitted to register in any additional credit courses until they obtain a level 5 score on the LPI examination.

First and Second Year students who fail a year will not be permitted to re-enrol in the Faculty of Science in the following academic session. Students will be considered for readmission when they have completed successfully at least two semesters (equivalent to UBC 30 credits) at a B.C. college or similar institution subsequent to their failure at UBC. They must then present a minimum Grade Point Average of 2.50, calculated on all university-transfer work **attempted** after they were required to discontinue. Failed Second Year students who have completed 36 or more credits of college or University courses, should consult the Office of the Dean to determine the number of college credits required for readmission.

Third and Fourth Year students who fail a year and are forced to discontinue may be considered for readmission to an academic session beginning at least one calendar year after the adjudication period in which they were required to discontinue studies in the Faculty of Science.

Applications for readmission by students required to discontinue should be submitted to the Office of Admissions.

A student who fails a year but passes in some courses can consider the passed subject matter completed and may go on to more advanced work in those passed subjects if and when permitted to re-enrol in the Faculty of Science.

Required to Withdraw

A student in any year who fails for the second time either in repeating a year or in a later year, or who does not meet promotion requirements within the maximum credit limits given above, will be required to withdraw from the University. An appeal for readmission to an academic session beginning at least one calendar year after the adjudication period in which a student was required to withdraw must be submitted to the Office of the Dean of Science. Readmission of a student in these circumstances would require approval of the Faculty of Science and ratification by the Senate Admissions Committee. No student required to withdraw from the University has a right to readmission.

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 interest of the student, or the University, or both.

Minor Programs

Students who wish to focus their non-Science electives may, with the approval of a Senior Faculty Adviser, undertake an optional Minor program in conjunction with a B.Sc. Major program. All courses in the Minor must be taken outside the Faculty of Science. There are two types of Minor program available:

- **Minor in Arts** – An acceptable program must comprise courses for Arts credit in the Faculty of Arts and consist of at least 18 credits numbered 300 or higher in a single subject or field of specialisation, together with any necessary prerequisites. Mathematics courses will count only for Science credit in any Minor program. Students should design a coherent and academically sound course of studies for their proposed Minor, which must be approved by a Senior Faculty Adviser in the Office of the Dean of Science at the beginning of the Second Year. Upon successful completion of the Minor program, the subject or field of specialisation will be denoted on the student's transcript.
- **Minor in Commerce** – Students must have completed six credits of first-year English, MATH 100 and 101, and must have Third Year standing in the Faculty of Science and approval of a Senior Faculty Adviser for entry into this program. The program consists of the following courses: ECON 309 (6), COMM 329 (3), COMM 457 (3), COMM 458 (3), COMM 465 (3). Students who have completed ECON 100 prior to entry into the program may use this course in lieu of ECON 309, but may require additional upper-level credits to satisfy graduation requirements. Upon successful completion of this Minor program, the notation "Minor in Commerce" will be placed on the student's transcript. Enrolment in this program is strictly limited. A student who registers in, but does not successfully complete, the Minor in Commerce may not use the Commerce courses taken to satisfy any part of the upper-level requirement.

Combined B.Sc. and D.M.D. Degree Program

Students who have completed the Third Year in one of the approved degree programs of the Faculty of Science at UBC and the first two years in the Faculty of Dentistry at UBC, and who have completed ALL the course requirements of the degree program may be eligible for the appropriate B.Sc. degree. It is necessary that such students meet all of the specific course requirements of the departmental degree program and **have the approval of the Head of the Department prior to entry into the Faculty of Dentistry**. Students should plan to meet these specific course requirements while in the Faculty of Science. With the approval of the Dean of Science up to 30 credits of course work in the Faculty of Dentistry may be recognized for credit towards the B.Sc. degree.

Students in the Faculty of Dentistry who wish to qualify for the B.Sc. degree must file a copy of their program in first and second year Dentistry with the Dean of Science by September 15 of the Winter Session of the year preceding the Fall in which they plan to qualify for the B.Sc. degree.

Combined B.Sc. and M.D. Degree Programs

Students who have completed the Third year in an approved degree program of the Faculty of Science and the first year in the Faculty of Medicine at UBC, may be eligible for the appropriate B.Sc. degree. The B.Sc. Degree will be awarded in the fall following completion of First Year Medicine provided that these requirements are met:

- 1) Completion of all specific course requirements of the Science degree program and **approval of the Department adviser prior to enrolling in First Year Medicine**;
- 2) Completion of the Faculty of Science requirements with approval of the Office of the Dean;
- 3) Filing of a copy of the First Year Medicine Authorization to Register form at the Office of the Dean of Science on or before September 15 of that year, to formally declare intent of obtaining a B.Sc. degree. Department approval may be noted on this copy;
- 4) Successful completion of the First Year of Medicine;
- 5) Application at the Registrar's Office for Fall graduation.

Veterinary Medicine

The Western College of Veterinary Medicine (W.C.V.M.) was established at the University of Saskatchewan to serve the four western provinces. A pre-veterinary program is required in preparation for admission to the four-year veterinary program at the W.C.V.M., and may be completed at UBC in the Faculty of Science or the Faculty of Agricultural Sciences.

The course requirements for admission to W.C.V.M. are:

- six credits each of English, Biology, Biochemistry¹, Chemistry, Physics, and Mathematics;
- three credits each of Genetics, Organic Chemistry, and Introductory Microbiology²; and
- additional electives to complete 60 credits. These prerequisites can be met in a number of departments in the Faculty of Science. However, since genetics and certain courses in biochemistry are offered only in third year, it will normally take longer than the minimum time to meet all requirements.

¹ The biochemistry requirement may be satisfied by completion of Biochemistry 300, or Biology 201 and Biochemistry 302

² Microbiology 200, or 201 and 202, will satisfy requirements. Microbiology 317 is not acceptable.

Competition for admission to W.C.V.M. is severe and although pre-veterinary requirements can be met in two years, few applicants are currently admitted with less than three years of university coursework. Therefore, pre-veterinary students who are enrolled in the Faculty of Science are strongly advised to follow a program that also satisfies the requirements of a B.Sc. program at UBC. Further information regarding entrance to Veterinary Medicine may be obtained from the Office of the Dean, Faculty of Agricultural Sciences, UBC, or directly from the University of Saskatchewan:

Faculty of Science Pairing List

Students may obtain credit for only one course in the following list of introductory courses in statistics.

- BIOL 300, GEOG 374, PLNT 321, PSYC 317-318, PSYC 366, STAT 200

(See also Probability and Statistics listings. For page number, see Index).

Listed below are courses in which there is sufficient overlap that credit may be obtained for only one course in each group. However, it does not necessarily follow that the courses in each group are equivalent.

Astronomy

- 1) ASTR 101, 200
- 2) ASTR 102, 200

Atmospheric Science

- 1) ATSC 200, GEOG 200 (and GEOG 201, SOIL 201 to 1990)
- 2) ATSC 300, GEOG 300 (and GEOG 201, SOIL 201 from 1991)
- 3) ATSC 301, GEOG 301
- 4) ATSC 302, GEOG 302
- 5) ATSC 303, GEOG 303
- 6) ATSC 411, OCGY 411
- 7) ATSC 414, OCGY 414

Chemistry

- 1) CHEM 103, 110, 120, 121, 122, 150, 151
- 2) CHEM 201, 205, 208
- 3) CHEM 202, 205, 208
- 4) CHEM 201, 251
- 5) CHEM 201, 252
- 6) CHEM 203, 213, 230, 260
- 7) CHEM 250, 310, 335
- 8) CHEM 251, 262, 301, 305
- 9) CHEM 252, 301, 305
- 10) CHEM 255, 301, 305
- 11) CHEM 311, 352
- 12) CHEM 313, 330

Computer Science

- 1) CPSC 100, 101, 111, 114, 122, 121, 151, 152, FRST 130
- 2) CPSC 116, 118
- 3) CPSC 126, 128
- 4) CPSC 216, ELEC 314
- 5) CPSC 248, ELEC 259
- 6) CPSC 220, ELEC 320
- 7) CPSC 302, 350, ELEC 258
- 8) CPSC 313, 315, ELEC 313, 315
- 9) CPSC 348, ELEC 476
- 10) CPSC 319, ELEC 389
- 11) CPSC 405, COMM 310
- 12) CPSC 406, COMM 410, 411
- 13) CPSC 413, ELEC 470
- 14) CPSC 414, ELEC 478
- 15) CPSC 417, ELEC 456
- 16) CPSC 435, FRST 435

Earth Science

- 1) EARTH 300, GEOG 400
- 2) EARTH 400, GEOG 420

Geography

- 1) GEOG 101, GEOG 102, EARTH 100
- 2) GEOG 301 with 103, 330
- 3) GEOG 200, ATSC 200, (and GEOG 201, SOIL 201 to 1990)

- 4) GEOG 205, CIVL 418
- 5) GEOG 306, GEOL 351 (to 1992 and current), GEOL 251 (1993-94)
- 6) GEOG 300, ATSC 300 (GEOG 204, SOIL 204 from 1991)
- 7) GEOG 301, ATSC 301
- 8) GEOG 302, ATSC 302
- 9) GEOG 303, ATSC 303
- 10) GEOG 308, SOIL 308
- 11) GEOG 330, with 102, 103

Geological Sciences

- 1) GEOL 100, 105, 125, 150
- 2) GEOL 205, 206, 256
- 3) GEOL 226, 256, 301
- 4) GEOL 304, 354
- 5) GEOL 251, 307, 351, GEOG 306
- 6) GEOL 358, 428
- 7) GEOL 368, 419
- 8) GEOL 200, 308
- 9) GEOL 201, 202
- 10) GEOL 205, 321
- 11) GEOL 251, 305, 351
- 12) GEOL 308, 202

Geophysics and Astronomy

- 1) GEOP 120, ERTI 100
- 2) GEOP 310, ASTR 310
- 3) GEOP 316, ASTR 316
- 4) GEOP 317, ASTR 317
- 5) GEOP 320, PHYS 406
- 6) GEOP 400, 420
- 7) GEOP 400, 421

Life Sciences

(Course numbers in parentheses correspond to those in 1987/88 Calendar.)

- 1) ANAT 390, 400 (for six credits)
- 2) ANSC 321, HUNU 309
- 3) ANSC 322, HUNU 305 or 307
- 4) ANSC 323, HUNU 309
- 5) BIOC 300, BIOL 201 plus BIOC 302, BIOL 201 plus BIOC 303
- 6) BIOL 101, 102, 103, 110 or 115 plus 120, 344 (310), 345 (311), 346 (313)
- 7) BIOL 101, 102, 103, 110 or 115 plus 120, FRST 300
- 8) BIOL 300, PLNT 321
- 9) BIOL 301, FRST 430, STAT 305
- 10) BIOL 305 (ZOO 316), OCGY 309, MRNE 435
- 11) BIOL 310 (ZOO 323), MRNE 416, PSYC 306
- 12) BIOL 324 (BOTA 311), PLNT 258
- 13) BIOL 327 (ZOO 311), PLNT 331
- 14) BIOL 334, AGSC 213, ANSC 313, FRST 302
- 15) BIOL 335 (336), MICB 325
- 16) BIOL 345 (311), 302 (321) and 303 (322)
- 17) BIOL 346 (315), MICB 200, 201, 417
- 18) BIOL 351 and 352 (BOTA 330), PLNT 324 and 325
- 19) BIOL 355 (ZOO 303), BIOL 363, ANSC 320, PHYL 301 and 302 or 303
- 20) BIOL 400 (422), MICB 400, SOIL 400
- 21) BIOL 403 (ZOO 406), OCGY 406
- 22) BIOL 426 (ZOO 415), MRNE 412
- 23) BIOL 438, PHYS 438
- 24) BIOL 451 (BOTA 415), OCGY 415
- 25) HUNU 203, and 305 plus 307
- 26) MICB 200, 201, 417, BIOL 346
- 27) MICB 200, 202
- 28) MICB 325, BIOL 335
- 29) MICB 400, BIOL 400, SOIL 400
- 30) MICB 401, SOIL 401
- 31) MICB 402, MEDG 410
- 32) MICB 502, MEDG 510
- 33) MRNE 446, BIOL 310 (ZOO 323), PSYC 306
- 34) OCGY 309, BIOL 305 (ZOO 316), MRNE 435
- 35) OCGY 406, BIOL 403 (ZOO 406)
- 36) OCGY 415, BIOL 451 (BOTA 415)
- 37) PCTH 300, 305 (390), PHAR 370, 380
- 38) PCTH 400, 302
- 39) PCTH 400, PHAR 385
- 40) PHYL 301 and 302 or 303, BIOL 353 (ZOO 303), ANSC 320
- 41) PSYC 201 and 202, 260
- 42) PSYC 304, 360
- 43) PSYC 317 and 318, 366
- 44) PSYC 306, MRNE 416, BIOL 310 (ZOO 323)

Mathematics

- 1) MATH 100, 111, 120, 140, 153
- 2) MATH 301, 121, 141, 154

- 3) MATH 152, 221, 223
- 4) MATH 200, 226, 253
- 5) MATH 227, 254, 317
- 6) MATH 205, 302, STAT 205, 241, 251, 302
- 7) MATH 255, 215
- 8) MATH 257, 316, PHYS 312
- 9) MATH 300, 350
- 10) MATH 301, 350

Oceanography

- 1) OCGY 309, BIOL 305, MRNE 435
- 2) OCGY 414, 405
- 3) OCGY 406, BIOL 403
- 4) OCGY 415, BIOL 451
- 5) OCGY 411, ATSC 411
- 6) OCGY 414, ATSC 414

Physics

- 1) PHYS 101/102, 121/122, 110, 115, 120, 153
- 2) PHYS 156, 203, 213
- 3) PHYS 170, 216
- 4) PHYS 200, 250
- 5) PHYS 206, 217
- 6) PHYS 209, 215
- 7) PHYS 251, 301, 311
- 8) PHYS 306, 456
- 9) PHYS 308, 458
- 10) PHYS 309, 319
- 11) PHYS 312, MATH 257, 316
- 12) PHYS 351, 401, 411
- 13) PHYS 402, 452
- 14) PHYS 403, 455
- 15) PHYS 406, GEOP 320
- 16) PHYS 438, BIOL 438

Statistics

- 1) STAT 200, 203
- 2) STAT 205, 241, 251, 302, MATH 205, 302

General Science Program

The General Science degree program recognizes five designated subject areas of the Faculty of Science. These areas are:

- 1) Chemistry (CHEM 0081)
- 2) Earth Science (Astronomy, Geography, Geology, Geophysics, and the following Oceanography courses: OCGY 308, 405, 407, 408, 409, 411, 413, 414, 416) (ERSC 0225)
- 3) Life Science (Biochemistry, Biology, Microbiology, Pharmacology, Physiology, Psychology and the following Oceanography courses: OCGY 309, 406, 410, 412, 415, 420) (LFSC 0440)
- 4) Mathematical Science (Computer Science, Mathematics, Statistics) (MASC 0029)
- 5) Physics (PHYS 0271)

In the first year the student must complete:

- CHEM 110 or 121 and 122,
- Two of: ENGL 110, 111, 112 or 120, 121 (112 recommended; one of these may be deferred to second year),
- MATH 100 and 101 (or 120 and 121),
- PHYS 100 and 101, or 101 and 102, or 121 and 122 and
- six to nine credits of Electives, which may be in Arts (including an additional three credits in first-year English) or an introductory course in Science (other than Chemistry, Mathematics and Physics).

Students in second year must register in the courses that are prerequisite to the third year courses of their proposed areas of concentration. They must also ensure that in First and second years their program includes a total of six credits of introductory Science courses other than Chemistry, Mathematics and Physics.

To satisfy the requirement of at least 30 credits of Science courses numbered 300 and above, the student may select

one of two routes within the General Science degree program:

- Route A — at least 18 credits numbered 300 or higher must be selected from each of two of the five subject areas specified above and register in both areas of specialization.
- Route B — at least 18 credits numbered 300 or higher must be in one of the above subject areas, at least six credits in a different area and at least six credits in an area different from these two. Students in route B will register in the major area of specialization only.

Courses selected must be acceptable for Major or Honours programs in the specific areas of concentration.

Students who successfully complete the B.Sc. General Science degree program will have recorded on their transcript the area or areas of concentration.

Aquacultural Science (AQSC)

Several Faculties cooperate to offer a program of study leading to a B.Sc. Honours degree in Aquacultural Science. This program involves study of the basic biology of organisms, and relevant aspects of applied aquatic biology, physical oceanography, bio-resource engineering and food science. For additional program information, please consult the Heads of the Departments of Animal Science or Zoology.

Certain courses in Marine Science are offered by the Western Canadian Universities (Bamfield) Marine Station on Vancouver Island. Up to 12 credits of their courses may be taken there in the spring or summer period preceding registration for the fourth year. For details, please consult the Departments of Botany and Zoology.

Requirements for the B.Sc. Degree

Honours (0406)

First Year

Course	Credits
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
CHEM 121, 122 (110)	6
PHYS 101 ² (121)	6-5
BIOL 110 or 115	3-0
BIOL 120 ³	4
Elective ^{4,5}	0-6
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 204, 205	6
BIOL 209	3
CHEM 230	6
Arts Elective ⁴	6
Elective ⁵	3
Total	30

Third and Fourth Years

Course	Credits
MICB 201, 202	6
BIOL 300	3
BIOL 302	3
BIOL 351	3
BIOL 335 or BIOL 134	3
MRNE 450	3
Six credits from BIOC 306, FOOD 301, ANSC 480	6
OCGY 308	3
One of BIOL 350, 351 and 352, BIOL 451, OCGY 415 or equivalent	3-6
One of MRNE 454, 460 or 470	3

Program electives ⁴	15-12
Elective	6
Arts Elective	6
BIOL 117	3
One of AGECE 199, ANSC 199, BIOE 199, BIOL 119, FOOD 199, MICB 199, OCGY 199	6
Total	72

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without credit for Physics 12 will be required to replace three credits of elective with PHYS 100 prior to PHYS 101.

³ Students with at least 80% in Biology 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of 100-level Arts or Science courses or 200-level BIOL courses. BIOL 120 is required of all students.

⁴ ECON 100 is recommended.

⁵ Program Electives: AGECE 258; ANSC 480, 481, 482; BIOE 306, 485; BIOL 320, 326, 405, 408, 426, 428, 429; FOOD 301, 308; MRNE 401, 410, 411, 412, 413, 420, 430, 435; BIOL 305 or OCGY 309, OCGY 406/BIOL 403, OCGY 412, 413; PCTH 305.

Astronomy (ASTR)

The Department of Geophysics and Astronomy offers opportunities for study in Astronomy at the bachelor's, master's and doctoral levels. For information on the M.Sc. and Ph.D. degree programs, see the Graduate Studies section of the *Calendar*.

Requirements for the B.Sc. Degree

Major (0030)

First Year

Course	Credits
CHEM 121, 122, (110)	6
MATH 100, 101, (120, 121)	6
PHYS 121, 122, (101, 102) ¹	6
ENGL 100-level ²	6
Arts Elective	6
Total	30

Second Year³

Course	Credits
MATH 200, 221, 215	9
PHYS 200, 203, 209	9
Electives ^{4,5}	6
Arts Elective	6
Total	30

Third Year

Course	Credits
ASTR 302, 303	6
PHYS 206, 301, 308	9
MATH 317	3
MATH 316 or PHYS 312	3
Electives ^{5,7}	9
Total	30

Fourth Year

Course	Credits
ASTR 401, 402	6
ASTR 421, 431	6
PHYS 303, 304	6
Electives ⁵	12
Total	30

¹ Students without Physics 12 should consult departmental adviser as early as practical. Normally they must take PHYS 100 prior to PHYS 101 or 121.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ Admissions requirement: 60% Standing in first-year Physics courses or permission of Department Head

⁴ Recommended: ASTR 200, unless credit obtained previously for ASTR 101/102.

⁵ Recommended: CPSC 122, 152 or 124.

⁶ Students who have not obtained a standing of at least 68% in PHYS 120, 122 or 102 should take PHYS 216 prior to PHYS 206.

⁷ For electives available in third and fourth years at least nine credits must be from outside the field of Major. The field of the Major consists of all courses in ASTR, GEPA, MATH and PHYS.

Honours

Astronomy and Geophysics

Focus Planetary Sciences

- Option A, GEPA - ASTR (0148)
- Option G, GEPA - GEOP (0152)

First Year

Course	Credits
CHEM 121, 122, (110)	6
MATH 100, 101, (120, 121)	6
PHYS 121, 122, (101, 102) ¹	6
ENGL 100-level ²	6
GEOP 120 ³	3
Elective ⁴	3
Total	30

Second Year

Course	Credits
CHEM 208	6
CPSC 122 or 152	3
GEOG 200	3
MATH 200, 215, 221	9
PHYS 200, 203, 209	9
Arts Elective	6
Total	36

Third Year

Course	Credits
GEPA 316, 317	6
GEOP 320	3
MATH 317	3
MATH 316 or PHYS 312	3
PHYS 303 or GEOP 321	3
PHYS 206, 301	6
PHYS 308 ⁵ or GEOP 321, 322 ⁵	3-6
Arts Elective	6
Total	33-36

Fourth Year

Course	Credits
PHYS 304	3
GEOP 121 or PHYS 403	3
GEOP 425	3
Option A ⁶	
ASTR 421, 431	6
ASTR 419	2-6
Science Electives ⁷	16-10
Option G ⁷	
GEOP 420, 421	9
GEOP 449	6
Science Electives	6
Total	31-30

¹ Students without Physics 12 should consult departmental adviser as early as practical. Normally they must take PHYS 100 prior to PHYS 101 and 102.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ Strongly recommended: ASTR 101 or GEOL 100. N.B. Special arrangements may be made for students unable to complete GEOP 120 in first year.

⁴ Required courses in the Astronomy Option. Science elective to be chosen in consultation with the Departmental program adviser.

⁵ Required courses in the Geophysics Option. Science elective to be chosen in consultation with the Departmental program adviser.

Combined Honours Astronomy and Physics

See Physics Programs.

Atmospheric Science (ATSC)

A program of undergraduate studies, diploma program in meteorology, and a Master's degree in Atmospheric Science are offered cooperatively by the Departments of Geography and Oceanography. Students should direct enquiries to the Chair, Atmospheric Science Program, University of British Columbia. For information on the M.Sc. degree program, see the Faculty of Graduate Studies section. Students wishing to undertake a Ph.D. program in the Atmospheric Sciences should consult the department most appropriate to the proposed field of specialization.

Requirements for the B.Sc. Degree

Major (0167)

First Year

Course	Credits
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 121, 122 (101, 102) ²	6
CHEM 121, 122 (110)	6
CPSC 100-level	3
Arts Elective	3
Total	30

Second Year

Course	Credits
ATSC/GEOG 200, 300 ³	6
MATH 200, 221	6
PHYS 213, 215, 216	9
Arts Elective	6
Elective ⁴	3
Total	30

Third Year

Course	Credits
ATSC/GEOG 301, 302, 303	9
MATH 215, STAT 200	6
PHYS 312 or MATH 316	3
Arts Elective	3
Electives ^{5,6}	9
Total	30

Fourth Year

Course	Credits
Nine credits from ATSC 410, 411, 412, ATSC/OCGY 411, 414	9
ATSC Electives ⁷	9
Electives ^{5,6}	12
Total	30

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without Physics 12 must take PHYS 100 prior to PHYS 101 or 121. Such students should then take PHYS 102 (122) in the second year.

³ For students transferring to ATSC and/or UBC to start at third year, one or both of these courses may be waived with permission of the Chair.

⁴ Nine credits must be Science courses from outside the Major field, or Arts. The Major field includes all courses in Atmospheric Science, Oceanography, Geography (Science) and Physics.

⁵ 15 credits of electives must be numbered 300 or higher.

⁶ Chosen from: CHEM 302 (prerequisite: CHEM 201); GEOG 401, 402, 403; OCGY 308; PHYS 314, 421; SOIL 314.

Honours¹

First Year

As for B.Sc. Major.	30
Total	30

Second Year

As for B.Sc. Major.	30
Total	30

Third Year

Course	Credits
ATSC/GEOG 301, 302, 303	9
ATSC Elective ²	0
MATH 215, 317	6
STAT 200	3
PHYS 312 or MATH 316	3
CHEM 201, 302	6
Arts Elective	3
Total	36

Fourth Year

Course	Credits
ATSC 440, 441, 442	9
ATSC 449	6
ATSC/OCGY 411, 414	6
ATSC Electives ²	9
Electives ³	6
Total	36

¹ Entry into the program requires a 70% average in the previous full year. Continuation in the program requires a 65% cumulative average for all courses taken in the program.

² Chosen from GEOG 205, 401, 402, 403; OCGY 308; PHYS 421; SOIL 314.

³ Students intending to seek federal employment as a meteorologist are urged to add a further three credits of physics in topics such as fluid mechanics, optics, applied physics, advanced mechanics.

Diploma Meteorology

The Diploma in Meteorology offers an intensive one-year program in theoretical and applied Meteorology. It is designed for students with little or no background in Meteorology who wish to direct their experience to environmental applications or to gain employment as a meteorologist.

Admission is based on an acceptable academic record (usually a bachelor's degree in physics, applied mathematics, engineering or similar disciplines). Typically this should include about 27 credits of mathematics (up to introduction to partial differential equations) and computer science (including some numerical analysis), and 21 credits of physics.

The diploma program requires a minimum of 30 credits of coursework in atmospheric science. Each student will plan an individual program in consultation with the Chair of the Atmospheric Science program. For those with sufficient mathematics and physics but no meteorology a typical program would include: ATSC 440, 441, 442, ATSC/GEOG 301, 302, 303, and ATSC/OCGY 411 and 414, plus six credits from CHEM 302, GEOG 401, 402, 403, MECH 482, OCGY 308, PHYS 421, SOIL 314. An exemption of up to 12 credits for courses already taken will be allowed. Students granted exemptions will be required to add electives of appropriate undergraduate or graduate courses. Additional courses may be added or substituted by the Chairman to make up the mathematics or physics background of the student. The total load is not to exceed 36 credits.

Biochemistry (BIOC)

The Department of Biochemistry and Molecular Biology offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information on the M.Sc. and Ph.D. degree programs, see the Faculty of Graduate Studies section of the *Calendar*.

There are two separate options leading to a B.Sc. degree within the Biochemistry program; one emphasizes the metabolic and structural aspects of Biochemistry (option A) and the other emphasizes the genetic and molecular biological aspects of Biochemistry (option B). Both Major

options provide a strong background in Biochemistry and both are sufficiently flexible for students to develop their interests in allied fields (e.g., microbiology, food science, chemistry, etc.).

Either Major option is appropriate for students who anticipate a professional career in the Health Sciences. Either of the two Honours options is the recommended route for students interested in graduate studies in Biochemistry or related disciplines. However, students enrolled in a Major program with a strong academic record may also apply for graduate studies.

Requirements for the B.Sc. Degree**Major (0244)****First Year**

Course	Credits
BIOL 110 or 115 ¹	3-0
BIOL 120 ¹	3
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS ²	6
ENGL 100-level ³	6
Elective	0-3
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
CHEM 205 (201, 202)	6
CHEM 203	6
MATH 200	3
Electives ³	9
Total	30

Third and Fourth Years

Course	Credits
BIOC 301 ⁴	3
BIOC 303	6
BIOL 334	3
CHEM 305	6
CHEM 313	6
BIOC 402, 403	6
Electives ⁵	24
Option A: Metabolic and Structural Aspects	
PHYL 301 ⁶	6
Option B: Molecular Biology	
BIOL 335	3
BIOC 410	3
Total	60

¹ BIOL 110 or 115 are not required of students with a grade of 80% or greater in Biology 12; these students are encouraged to choose instead three credits of free electives. BIOL 120 is required for all students.

² The requirement of six credits of Physics must include PHYS 101 (3) and any other PHYS course that is available for credit in the Faculty of Science. Although students with Physics 12 may defer three credits of Physics until second year, students are encouraged to complete this program requirement in their first year.

³ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

⁴ Electives (33 or 36 credits) must include the following:

- At least 12 credits must be for courses numbered 300 or higher.
- At least 12 credits must be in the Faculty of Arts (and in addition to the six credits of first year English). Another six credits may be taken in any Faculty (including Science and can be within the field of the major).
- Of the remaining 15 or 18 credits of electives (i.e., 33 or 36 minus 18), at least nine must be either Science electives outside the field of the major or in Arts; the remaining six or nine credits can be from the Faculties of Arts or Science and can be within the field of the major.
- The field of the major for Biochemistry is defined as all courses in Biochemistry, Biology, Chemistry and Microbiology and all courses offered for Science credit by departments in the Faculty of Medicine.

⁵ All students with a major in Biochemistry are required to register for this laboratory course in the third year of their program.

⁶ Because of a timetable conflict students must take either PHYL 301 or CHEM 305 in the third year.

Honours (0186)**Option A: Metabolic and Structural Aspects****First Year**

Course	Credits
BIOL 110 or 115 ¹	3-0
BIOL 120 ¹	3
CHEM 121, 122 (110)	6
MATH 100, 101 (or 120, 121)	6
PHYS ²	6
ENGL 100-level ³	6
Electives	0-3
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
CHEM 203	6
CHEM 201, 202	6
MATH 200	3
MICB 200	6
Science Elective	3
Arts Elective	6
Total	36

Third Year

Course	Credits
BIOC 303	6
BIOC 301	3
CHEM 313	6
CHEM 305	6
BIOL 334	3
Science Electives	6
Arts Elective	6
Total	36

Fourth Year

Course	Credits
BIOC 402, 403	6
BIOC 404	3
BIOC 420	3
BIOC 421 or 419	3-6
PHYL 301	6
Science Electives	2-5
Three credits from CHEM 310, 335, 405, 411, 413	3
Total	30

Honours (0186)**Option B: Molecular Biology****First and Second Year**

As in Option A

Third Year

Course	Credits
BIOC 301	3
BIOC 303	6
CHEM 305	6
CHEM 313	6
BIOL 334	3
BIOL 335	3
Arts Elective	6
Total	33

Fourth Year

Course	Credits
BIOC 402, 403	6
BIOC 404	3
BIOC 410	3
BIOC 420	3
BIOC 421	3
MICB 302 or 408 or 409	3
Science Electives	12
Total	33

¹ BIOL 110 or 115 are not required of students with a grade of 80% or greater in Biology 12; these students are encouraged to choose instead three credits of free electives. BIOL 120 is required for all students.

² The requirement of six credits of Physics must include PHYS 101 (3) and any other PHYS course that is available for credit in the Faculty of Science. Although three credits of Physics may be deferred until second year, students are encouraged to complete this program requirement in their first year.

⁵ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

**Combined Honours (0565)
Biochemistry and Chemistry
(BIOC, CHEM)**

First Year

Course	Credits
BIOL 110 or 115 ¹	3-0
BIOL 120 ¹	3
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS ²	6
ENGL 100-level ³	6
Electives	0-3
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
CHEM 205	6
CHEM 201 and 202	6
MATH 200	3
Arts Electives ⁴	12
Total	33

Third Year

Course	Credits
BIOC 303	6
BIOC 301	3
CHEM 313	6
CHEM 305 (304)	6
CHEM 311	3
BIOL 334, 335	6
Electives	3
Total	34

Fourth Year

Course	Credits
BIOC 402, 403	6
BIOC 404	3
CHEM 310 (335)	6
Chemistry Electives ⁵	5
CHEM 449 or BIOC 420, 421, or 419	6
BIOC 410	3
Electives	6
Total	35

¹ BIOL 110 or 115 are not required of students with a grade of 80% or greater in BIOL 12; these students are encouraged to choose instead three credits of free electives. BIOL 120 is required for all students.

² The requirement of six credits of Physics must include PHYS 101 (three credits) and any other PHYS course that is available for credit in the Faculty of Science. Although students with Physics 12 may defer three credits of Physics until second year, students are encouraged to complete this program requirement in their first year.

³ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

⁴ Students intending to take CHEM 312 should take MATH 221 in second year. In all other instances, students are encouraged to complete their Arts electives in the second year.

⁵ To be chosen from CHEM 312 and 400 level Chemistry lecture courses (CHEM 405, 406, 411, 413, 435 recommended).

Biology (BIOL)

The Departments of Botany and Zoology jointly offer only one undergraduate degree, that is a degree in Biology. The two departments separately offer opportunities for study leading to master's and doctoral degrees. For information on these see the Faculty of Graduate Studies section of the *Calendar*. Students wishing to undertake a graduate program in Biology at UBC should contact the Life Science departments most appropriate to the field of specialization.

There are nine undergraduate degree options leading to a Major or Honours B.Sc. in Biology. It is also possible to obtain a minor in Arts or Commerce together with a Major in Biology. A Biology Program Planning Guide is available from the Biology Program Office, Room 2521 in the Biological Sciences Building.

Certain courses in Marine Science are offered by the Western Canadian Universities Marine Biological Society at the Bamfield Marine Station on Vancouver Island. Up to 12 credits may be taken at the Bamfield Marine Station in the spring or summer period preceding registration for the fourth year. For details, please consult the Departments of Botany and Zoology.

Note: BIOL 120 (or 101 or 102 or 103 or equivalent) is prerequisite to all Biology courses, except BIOL 153, 343, 344, 345, 346 and 446.

Primarily for First Year Students

BIOL 120 is a prerequisite for admission to Major or Honours options in the Biology Program. Students who receive a grade of at least 80% in Biology 12 are encouraged to enter BIOL 120 directly. Other students will need to take either BIOL 110 or 115 prior to registering in BIOL 120. The course selected is determined by the level of biology completed in high school as noted under course description. Students interested in meeting the entrance requirements of the Faculties, or Schools, of Agricultural Sciences, Dentistry, Forestry, Family and Nutritional Sciences, Medicine, Pharmaceutical Sciences, Human Kinesiology, and Rehabilitation Medicine should consult the appropriate office to determine the first-year Biology requirement.

Requirements for the B.Sc. Degree

Major and Honours (All Options)

First Year

ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
CHEM 121, 122 (110)	6
PHYS 101 ² (121)	6-3
BIOL 110 or 115 ³	3-0
BIOL 120 ⁴	3
Elective ²	0-6
Total	30

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without credit for Physics 12 will be required to replace three credits of Elective with PHYS 100 (prior to PHYS 101).

³ Students with at least 80% in Biology 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of 100-level Arts or Science courses or 200-level BIOL courses. BIOL 120 is required of all students.

**Major (0149)
Animal Biology (ANBI)**

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 204, 205	6
CHEM 230	6
Electives ^{1,2}	12
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302, 303	6
BIOL 334	3
BIOL 335 or 434	3
BIOL 353	6

Animal Biology Electives	18
Electives ²	21
Total	60

**Honours (0054)
Animal Biology (ANBI)**

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 204, 205	6
CHEM 230	6
Science Electives ¹	6
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302, 303	6
BIOL 334	3
BIOL 335 or 434	3
BIOL 353	6
BIOL 331	3
BIOL 447	3
BIOL 449	6
Arts Elective	6
Animal Biology Electives	21
Electives ¹	12
Total	72

¹ BIOL 209, 210 recommended.

² The 33 credits of electives have the following requirements:

- i. At least 12 credits of Arts.
- ii. A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOC, BIOL, MICB, MRNE, OCGY 309, 316, 406, 412, 413, 415; PSYC 304, 306 and PSYC courses numbered 60 or higher in the last two digits; and courses in the Faculty of Medicine that have Science credit.
- iii. A further six credits of Arts or Science courses (may include courses from the Animal Biology Electives list below).
- iv. Of the 27 credits defined so far, at least nine must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
- v. Six credits may be in any Faculty.

³ BIOL 347 strongly recommended. Consult a Biology adviser before choosing electives.

Animal Biology Electives: BIOC 302; BIOL 301, 305, 310, 325, 326, 327, 328, 331, 332, 333, 337, 350, 354, 405, 410, 411, 413, 414, 416, 418, 419, 425, 426, 427, 430, 410, 441, 445, 446, 448⁴, 450, 453, 454, 455, 456, 457; MRNE 410, 411, 412, 413, 430, 440, 445, 446.

⁴ Three credits of BIOL 448 with permission of the Chair of the Undergraduate Program.

**Major (0633)
Cell Biology and Genetics
(CGBI)**

Second Year

Course	Credits
BIOL 200, 201	6
Six credits from BIOL 204, 205, 209, 210 or MICB 201, 202	6
CHEM 230	6
Electives ^{1,2}	12
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302 or 303	3
BIOL 334, 335	6
BIOL 350	6
BIOC 302 or 303 ³	3 or 6
Cell Biology and Genetics Electives ⁴	18 or 15
Electives ²	21
Total	60

¹ CHEM 205 recommended.

² The 33 credits of electives have the following requirements:

- i. At least 12 credits of Arts.
- ii. A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOC,

- BIOL, MICB, MRNE, OCGY 309, 406, 412, 413, 415; PSYC 304, 306 and courses numbered 60 or higher in the last two digits; and courses in the Faculty of Medicine that have Science credit.
- A further six credits of Arts or Science courses (may include courses from the Cell Biology and Genetics Electives list below).
 - Of the 27 credits defined so far, at least nine must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
 - Six credits may be in any Faculty.

¹ Depending on whether BIOC 302 (3) or BIOC 303 (6) is taken.

Cell Biology and Genetics Electives: ANAT 405, BIOC 402, 403, 410, 421; BIOL 330, 331, 332, 337, 352, 430, 431, 432, 433, 434, 435, 436, 437, 441, 444, 448, 450, 452, 455; MEDG 410, 419, 420, 421, 430; MICB 302, 402, 408, 409; MRNE 411. **Note:** Students must select 21 credits of which 12 must be BIOL. For specialization in cell biology, some of BIOL 330, 331, and 352 are recommended. For specialization in genetics, BIOL 337 or 432 is recommended.

² Three credits of BIOL 418 with permission of the Chair of the Undergraduate Program.

Honours (0405) Cell and Developmental Biology (CELL)

Second Year

Course	Credits
BIOL 200, 201	6
Six credits from BIOL 204, 205, 209, 210 or MICB 201, 202	6
CHEM 230	6
Arts Elective	6
Elective	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302 or 303	3
BIOL 331 or 352	3
BIOL 334, 335	6
BIOL 350	6
BIOL 350	3
BIOC 303	6
BIOL 417	3
BIOL 449	6
Cell and Development Electives	15
Arts Electives	6
Electives ²	12
Total	72

CHEM 205 is recommended.

² BIOL 347 is strongly recommended. Consult a Biology adviser before choosing electives.

Cell and Development Electives: ANAT 405; BIOC 402, 403, 410, 421; BIOL 330, 331, 332, 337, 351, 352, 430, 431, 432, 433, 435, 436, 437, 441, 450, 452, 455; MEDG 421; MICB 302, 402, 408, 409; MRNE 411.

Major (0582) Conservation Biology (CONS)

Second Year

Course	Credits
BIOL 200, 201	6
One of BIOL 204, 205	3
One of BIOL 209, 210, 320, 321, 322, 323, 324	3
CHEM 230	6
Electives ^{1,2}	12
Total	30

Third and Fourth Years

Course	Credits
BIOL 300, 301	6
BIOL 302, 303	6
BIOL 334	3
BIOL 353 or 351	6 or 3
BIOL 416	3
BIOL 434	3
Conservation Electives	6 or 9
Systematics/Evolution Electives	6
Electives ²	21
Total	60

Honours (0583) Conservation Biology (CONS)

Second Year

Course	Credits
BIOL 200, 201	6
One of BIOL 204, 205	3
One of BIOL 209, 210, 320, 321, 322, 323, 324	3
CHEM 230	6
Science Electives ¹	6
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300, 301	6
BIOL 302, 303	6
BIOL 334	3
BIOL 353 or 351	6 or 3
BIOL 414 or 415	3
BIOL 416	3
BIOL 434	3
BIOL 417	3
BIOL 449	6
Conservation Electives	12
Systematics/Evolution Electives	12
Arts Electives	6
Electives ³	3-6
Total	72

¹ Choose second year courses that are prerequisites for desired upper-level electives.

² The 33 credits of electives have the following requirements:

- At least 12 credits of Arts.
- A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOL, MRNE, OCGY, PSYC 304, 306 and PSYC courses numbered 60 or higher in the last two digits; courses in the Faculty of Medicine that have Science credit; and courses on the Conservation Electives list below.
- A further six credits of Arts or Science courses (may include courses from the Conservation and Systematics/Evolution Electives lists below).
- Of the 27 credits defined so far, enough credits must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
- Six credits may be in any Faculty.

³ BIOL 347 is recommended. Consult a Biology adviser before choosing electives.

Conservation Electives: ANSC 321, 322, 323, 425; BIOL 305, 310, 343, 402, 403, 404, 406, 407, 408, 409, 410, 411, 419, 434, 448⁵; CONS 200, 330, 430, 440; FRST 387, 395, 420, 485, 495; GEOG 300, 310, 315, 415, 418; LAW 336, 358; MICB 400; MRNE 430, 435, 445, 440; OCGY 410; PLNT 338, 404; SOIL 314, 403, 415.

⁴ All listed courses numbered 300 or higher in ANSC, BIOL, MRNE, and OCGY have Science credit.

⁵ Three credits of BIOL 448 with permission of the Chair of the Undergraduate Program.

Systematics/Evolution Electives: BIOL 320, 321, 322, 323, 324, 326, 327, 328, 332, 412, 413, 414, 415, 418, 421, 422, 424, 426, 427.

Major (0289) Ecology and Environmental Biology (ECOL)

Second Year

Course	Credits
BIOL 200, 201	6
One of BIOL 204, 205	3
One of BIOL 209, 210	3
CHEM 230	6
Electives ¹	12
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302, 303	6
BIOL 334	3
BIOL 351 and 352, or 353	6
BIOL 434 or 335	3

Ecology Electives	18
Electives ¹	21
Total	60

Honours (0045) Ecology and Environmental Biology (ECOL)

Second Year

Course	Credits
BIOL 200, 201	6
One of BIOL 204, 205	3
One of BIOL 209, 210	3
CHEM 230	6
Science Electives	6
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302, 303	6
BIOL 334	3
BIOL 434 or 335	3
BIOL 351 and 352, or 353	6
BIOL 414 or 415	3
BIOL 417	3
BIOL 449	6
Ecology Electives	21
Arts Elective	6
Electives ²	12
Total	72

¹ The 33 credits of electives have the following requirements:

- At least 12 credits of Arts.
- A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOL, MRNE, OCGY, PSYC 304, 306 and PSYC courses numbered 60 or higher in the last two digits; and courses in the Faculty of Medicine that have Science credit.
- A further six credits of Arts or Science courses (may include courses from the Ecology Electives list below).
- Of the 27 credits defined so far, at least nine must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
- Six credits may be in any Faculty.

² BIOL 347 is recommended. Consult a Biology adviser before choosing electives.

Ecology Electives: BIOL 301, 305, 310, 320, 321, 322, 323, 324, 326, 327, 328, 332, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 418, 419, 426, 427, 434, 439, 448⁵; MICB 400, 404; MRNE 430, 435.

⁵ Three credits of BIOL 448 with permission of the Chair of the Undergraduate Program.

Major (0572) General Biology (GENB)

Second Year

Course	Credits
BIOL 200, 201	6
Nine credits from BIOL 204, 205, 209, 210, and MICB 201, 202	9
CHEM 230	6
Electives ¹	9
Total	30

Third and Fourth Years

Course	Credits
Three more credits from BIOL 204, 205, 209, 210 and MICB 201, 202	3
BIOL 300	3
BIOL 302, 303	6
BIOL 334	3
BIOL 335 or 334	3
BIOL 350 or 351 and 352 or 353	6
BIOL courses numbered 300 or above	12
Electives ¹	24
Total	60

**Honours (0183)
General Biology (GENB)**

Second Year

Course	Credits
BIOL 200, 201	6
Twelve credits from BIOL 204, 205, 209, 210, and MICB 201, 202	12
CHEM 230	6
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
The remaining six credits from BIOL 204, 205, 209, 210 and MICB 201, 202	6
BIOL 300	3
BIOL 302, 303	6
BIOL 334	3
BIOL 335 or 434	3
BIOL 350 or 351 and 352, or 353	6
BIOL 447	3
BIOL 449	6
Subdiscipline Electives ²	24
Free Elective ⁴	6
Arts Elective	6
Total	72

¹ The 33 credits of electives have the following requirements:

- At least 12 credits of Arts.
- A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOC, BIOL, MICB, MRNE, OCGY 309, 406, 412, 413, 415; PSYC 304, 306 and PSYC courses numbered 60 or higher in the last two digits; and courses in the Faculty of Medicine that have Science credit.
- A further six credits of Arts or Science courses (may include courses from the field of the Major).
- Of the 27 credits defined so far, at least 15 must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
- Six credits may be in any Faculty.

² Chosen in consultation with a Biology adviser from three of the following subdisciplines: systematics and evolution, ecology, physiology and biochemistry, cell and development, genetics. Nine credits must be from each of two subdisciplines and six credits from a third. Courses must be numbered 300 or higher.

³ In any Faculty including, but not limited to, Science. BIOL 347 recommended.

**Honours (0415)
Genetics (GENE)**

See Cell Biology and Genetics for a Majors Program.

Second Year

Course	Credits
BIOL 200, 201	6
Six credits from BIOL 204, 205, 209, 210	6
CHEM 230	6
MICB 201	3
Elective ¹	3
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302 or 303	3
BIOL 334, 335	6
BIOL 337 or 432	3
BIOC 303	6
BIOL 350	6
BIOL 447	3
BIOL 449	6
Genetics Electives	15
Arts Electives	6
Electives ¹	15
Total	72

¹ BIOL 347 is recommended. Consult a Biology adviser before choosing electives.

Genetics Electives: Students must select 15 credits from the courses listed below, of which nine credits must be from BIOL courses.

BIOC 402, 403, 410, 421; BIOL 331, 337, 430, 431, 432, 433, 434, 436, 452, MEDG 410, 419, 420, 421, 430; MICB 302, 408, 409.

**Major (0248)
Marine Biology (MRNB)**

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 205, 209	6
CHEM 230	6
Electives ¹	12
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302, 303	6
BIOL 320	3
BIOL 326	3
BIOL 334	3
BIOL 335 or 434	3
BIOL 351 and 352, or 353	6
Marine Biology Electives	12
Electives ¹	21
Total	60

**Honours (0518)
Marine Biology (MRNB)**

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 205, 209	6
CHEM 230	6
Science Electives	6
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300	3
BIOL 302, 303	6
BIOL 320	3
BIOL 326	3
BIOL 334	3
BIOL 335 or 434	3
BIOL 351 and 352, or 353	6
BIOL 447	3
BIOL 449	6
Marine Biology Electives ²	21
Arts Electives	6
Electives ³	9
Total	72

¹ The 33 credits of electives have the following requirements:

- At least 12 credits of Arts.
- A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOL, MRNE, OCGY; PSYC 304, 306 and PSYC courses numbered 60 or higher in the last two digits; and courses in the Faculty of Medicine that have Science credit.
- A further six credits of Arts or Science courses (may include courses from the Marine Biology Electives list below).
- Of the 27 credits defined so far, at least nine must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
- Six credits may be in any Faculty.

² At least three credits must be taken at a marine station such as the Banfield Marine Station. This requirement usually will be fulfilled in the summer prior to fourth year.

³ BIOL 347 is recommended. Consult a Biology adviser before selecting electives.

Marine Biology Electives: BIOL 301, 305, 325, 331, 332, 402, 403, 405, 408, 413, 426, 428, 429, 448¹, 451; MRNE 410, 411, 412, 413, 420, 430, 435, 445, 450, 454, 460, 470; OCGY 308, 405, 407, 410, 412, 413.

¹ Three credits of BIOL 448 with permission of the Chair of the Undergraduate Program.

**Major (0305)
Plant Biology (PLTB)**

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 209, 210	6
CHEM 230	6
Electives ^{1,2}	12
Total	30

Third and Fourth Years

Course	Credits
BIOL 300 ³	3
BIOL 324	3
BIOL 302, 303	6
BIOL 334	3
BIOL 335 or 434	3
BIOL 351, 352	6
BIOL 415	3
Plant Biology Electives	12
Electives ²	21
Total	60

**Honours (0372)
Plant Biology (PLTB)**

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 209, 210	6
CHEM 230	6
Science Electives ¹	6
Arts Electives	6
Total	30

Third and Fourth Years

Course	Credits
BIOL 300 ³	3
BIOL 324	3
BIOL 302, 303	6
BIOL 334	3
BIOL 335 or 434	3
BIOL 351, 352	6
BIOL 415	3
Two of BIOL 320, 321, 322, 323	6
One of BIOL 420, 433, 439, 452	3 or 6
BIOL 447	3
BIOL 449	6
Plant Biology Electives	12
Electives ¹	6 or 9
Arts Elective	6
Total	72

¹ BIOL 204 or 205 recommended.

² The 33 credits of electives have the following requirements:

- At least 12 credits of Arts.
- A further nine credits in Arts or in Science outside of the field of the Major. The field of the Major consists of all courses in BIOC, BIOL, MICB, MRNE; OCGY 309, 406, 412, 413, 415; PSYC 304, 306 and PSYC courses numbered 60 or higher in the last two digits; and courses in the Faculty of Medicine that have Science credit.
- A further six credits of Arts or Science courses (may include courses from the Plant Biology Electives list below).
- Of the 27 credits defined so far, nine must be upper-level Arts or Science courses to ensure a program minimum of 48 upper-level credits.
- Six credits may be in any Faculty. Courses in PLNT, FRST, and SOIL may be useful; consult an adviser.

³ An equivalent statistics course may be taken with permission of the Head of Botany.

⁴ BIOL 347 is recommended. Consult a Biology adviser before selecting electives.

Plant Biology Electives: BIOL 301, 320, 321, 322, 323, 330, 332, 333, 343, 350, 401, 404, 406, 407, 412, 414, 416, 418, 420, 421, 422, 424, 429, 435, 436, 439, 444, 445, 446, 448¹, 451, 452; MRNE 420, 430, 450.

⁵ Three credits of BIOL 448 with permission of the Head of Botany.

Combined Honours (0057) Biology and Chemistry Honours (BIOL, CHEM)

First Year

Course	Credits
BIOL 110 or 115 ¹	0.5
BIOL 120	5
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS 100 or 200-level	6
ENGL 100-level ²	6
Elective	5.0
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
CHEM 205 (201 and 202)	6
CHEM 205	6
MATH 200	3
MBB 201, 202	6
Arts Elective	6
Total	33

Third Year

Course	Credits
BIOL 331, 335	6
BIOL 350	6
CHEM 305 (or 301)	6
CHEM 313	6
BIOL Electives	6
Arts Elective	6
Total	36

Fourth Year

Course	Credits
BIOL 303	9
CHEM 335 (or 310)	6
CHEM 331	4
CHEM Electives	8
BIOL Elective	3
BIOL or CHEM 119	6
Total	33

¹ Students with at least 80% in Biology 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of 100-level Arts or Science courses or 200-level BIOL courses.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ Chosen from 100-level Arts or Science courses or 200-level BIOL courses.

⁴ Organismal. Six credits from: BIOL 201, 205, 209, 210, 321 and 332.

⁵ To be chosen from 100-level CHEM lecture courses.

⁶ Biology course pertaining to organisms suggested.

Combined Honours Biology and Oceanography

See Oceanography Honours.

Graduate Program

The field of Biology is not treated by a single department. Students wishing to pursue a graduate program in Biology should consult the department or departments most appropriate to the field of specialization. Graduate study in Biology is designed to accommodate those students with a diverse biological background. For further information consult the Faculty of Graduate Studies section of the *Calendar*.

Marine Science

Certain marine science courses are offered at the Western Canadian Universities' Marine Biological Station (WCU-MBS) on Vancouver Island (Bamfield) during the Spring and Summer Sessions. Details may be obtained by

writing the WCU-MBS Representative, c/o Dean of Science, 1507 - 6270 University Boulevard, The University of British Columbia, Vancouver, B.C. V6T 1Z1. Marine Science courses listed in the "Courses of Instruction" section of the *Calendar* are designed for Life Science students at the Third- and Fourth-Year level.

Botany (BOTA)

The Department of Botany offers programs of study jointly with the Department of Zoology leading to the bachelor's degree (B.Sc.) in Biology.

The Department of Botany offers programs leading to the master's and doctoral degrees in a wide range of contemporary plant studies, including phytogeography, ecology (including ecophysiology), ethnobotany, systematics (including chemotaxonomy), morphology and plant development, cytology, membrane biochemistry and physiology, chemical ecology, and molecular genetics. For further information on the M.Sc. and Ph.D. degree programs consult the Faculty of Graduate Studies section of the *Calendar* and the Department of Botany's Graduate Brochure, available in the Botany Office.

Chemistry (CHEM)

The Department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information regarding facilities for graduate study see the Faculty of Graduate Studies section of the *Calendar*. It is assumed that all students entering courses of the Department have passed Chemistry 11 or the equivalent; those who have not must consult the Department before registering. 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

Major (0409)

First Year

Course	Credits
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS 100 or 200-level	6
ENGL 100-level ¹	6
Electives ²	6
Total	30

Second Year

Course	Credits
CHEM 201, 202	6
CHEM 205	6
MATH 200	3
Science Elective ³	6
Electives ⁴	9
Total	30

Third and Fourth Years

Course	Credits
CHEM 310 or 355 ⁵	6
CHEM 311 ⁶	4
CHEM 415	2
MATH 221 ⁷	3
Any two of a, b or c below:	
a) CHEM 301 or 305	6
b) CHEM 312 ⁸	4
c) CHEM 313 or 330	6
CHEM Electives ⁹	6-8
Electives ¹⁰	2 ⁷
Total	60

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² MATH 221 is prerequisite for CHEM 312; students planning to take CHEM 312 in third year must take MATH 221 in second year.

³ At least 18 credits (including ENGL 100-level) must be in the Faculty of Arts. A further nine elective credits must be either Science electives outside the field of the Major, or in Arts. A further six elective credits may be taken in any Faculty. Enough elective credits must be numbered 300 or higher so that the total of 300 or higher level courses in the program, including specified courses, is at least 48 credits. The field of the major in Chemistry is defined as all courses in Chemistry, Physics, and Biochemistry.

⁴ Must be taken in third year.

⁵ Major students who have satisfactory academic standing may enrol in CHEM 419 with permission of Head of the Department.

Major Environmental Option (2995)

First Year

Course	Credits
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS 100- or 200-level	6
ENGL 100-level ¹	6
GEOG 101	6
Total	30

Second Year

Course	Credits
CHEM 201, 202	6
CHEM 205	6
MATH 200	3
STAT 200	3
BIOL 401 or 115 or 120	3
Electives ²	9
Total	30

Third and Fourth Years

Course	Credits
CHEM 301, 302	6
CHEM 305 (301)	6
CHEM 311	4
CHEM 313 (330)	6
CHEM 335 (310)	6
CHEM 415	2
Six credits from ³	6

BIOL 302, 303; GEOG 201, 205, 207
MICB 417; OC/GY 308, 309; ECON 100 or 309; SOIL 200, 301

or other environmentally directed courses from outside CHEM, approved by a Chemistry Department adviser

Electives⁴ 21
Total 60

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² At least 18 credits (incl ENGL 100-level) must be in the Faculty of Arts. A further nine credits must be either Science electives outside the field of the Major or in Arts. A further six elective credits may be taken in any Faculty. The field of the Major in Chemistry (Environmental Option) is defined as all courses in Chemistry, Physics, and Biochemistry, plus all environmentally directed courses as defined by a Chemistry Department adviser.

³ Must be taken in third year.

⁴ Enough elective credits must be numbered 300 or higher so that the total of 300 or higher level courses in the program, including specified courses, is at least 48 credits.

Honours (0213)

First Year

Course	Credits
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS 100- or 200-level	6
ENGL 100-level ¹	6
Elective	6
Total	30

Second Year

Course	Credits
CHEM 201, 202	6
CHEM 205	6

MATH 200, 221	6
Electives ²	18
Total	36

Third Year

Course	Credits
CHEM 304	6
CHEM 310 or 335	6
CHEM 311	4
CHEM 312	4
CHEM 313 or 330	6
Electives ²	6
Total	32

Fourth Year

Course	Credits
CHEM 401	3
CHEM 415	4
CHEM 449	6
CHEM electives ³	9
Electives ²	12
Total	34

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Six credits of Physics or another Science are strongly recommended. Electives must include at least 12 credits of Arts.

³ Chosen from CHEM 302 and 400-level courses

Note: Reading knowledge of French, German or Russian is highly desirable. Students who have taken French in Secondary School should take German or Russian.

Honours Environmental Option (0677)

First Year

Course	Credits
CHEM 121, 122 (or 110)	6
MATH 100, 101 (120, 121)	6
PHYS 100- or 200-level	6
ENGL 100-level ¹	6
BIOL 110 or 115 ²	3
PIOL 120 ²	3
Total	30

Second Year

Course	Credits
CHEM 201, 202	6
CHEM 203	6
MATH 200, 221 ⁴	6
STAT 200	3
GEOG 101 (or 102, 103)	6
Electives ⁵	6
Total	33

Third Year

Course	Credits
CHEM 301, 302	6
CHEM 304 (305)	6
CHEM 311	4
CHEM 330 (313)	6
CHEM 310 (335)	6
Electives ⁵	6
Total	34

Fourth Year

Course	Credits
CHEM 312	4
CHEM 415	4
CHEM 449	6
CHEM Electives ⁶	6
ECON 100 or 309 ⁷	6
Electives ⁵	9
Total	35

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students with at least 80% in Biology 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of 100-level Arts or Science courses.

³ MATH 221 is prerequisite to CHEM 312, it may be postponed until third year.

⁴ A total of 18 credits of Arts must be taken. These include first-year English, ECON 100 or 309 and six further Arts credits.

⁵ Twelve elective credits must be from BIOL 302, 303; GEOG 204, 205, 207; GEOL 342, 442, 443, 444; MICH 417; OCGY 308, 309; SOIL 200, 304 or other environmentally directed courses from outside CHEM, approved by a Chemistry Department Adviser.

⁶ CHEM 417 is suggested.

Combined Honours Biochemistry and Chemistry

See Biochemistry programs.

Combined Honours Biology and Chemistry Honours

See Biology programs.

Combined Honours Chemistry and Another Subject

First Year

Course	Credits
ENGL 100-level	6
CHEM 121, 122 (110)	6
PHYS 100-level	6
MATH 100, 101 (120, 121)	6
Electives ¹	6
Total	30

Second Year

Course	Credits
CHEM 201, 202, 203	12
MATH 200	3
Additional credits in consultation with other department	12
Electives ^{1,2}	9
Total	36

Third Year

Course	Credits
CHEM 301 (305)	6
CHEM 310 (335)	6
CHEM 312 or 313 (330) ³	6
Additional credits in other department	12
Credits chosen in consultation with other department	6
Total	34-36

Fourth Year

Course	Credits
CHEM 311	4
Chemistry electives numbered 300 or above ⁴	10-8
Additional credits in other department	12
CHEM 449 ⁵	6
Total	32-30

¹ The electives must include at least 12 credits in the Faculty of Arts.

² Students intending to take Chemistry 312 in third year must take Mathematics 221 in second year.

³ The choice of Chemistry 312 or 313 (330) will depend on the other subject taken.

⁴ Must include at least five credits numbered 400 and above.

⁵ This may be substituted by an equivalent thesis course in the other department.

Combined Honours (0206) Chemistry and Mathematics Honours (CHEM, MATH)

First Year

Course	Credits
CHEM 121, 122 (110)	6
MATH 120, 121 (100, 101)	6
PHYS 100-level	6
ENGL 100-level ¹	6
Elective ²	6
Total	30

Second Year

Course	Credits
CHEM 201, 202	6
CHEM 203	6
MATH 223 (221)	3
MATH 226, 227, (200, 317)	6
Electives ³	9
Arts Electives	6
Total	36

Third Year

Course	Credits
CHEM 304	6
CHEM 310	6
CHEM 312	4
MATH 320, 321	6
Nine credits from MATH 300, 301, 316, 322, 323, 331	9
Elective	3
Total	34

Fourth Year

Course	Credits
CHEM 311	4
CHEM 401	3
CHEM 415	2
CHEM electives	5
Twelve credits from MATH 400-403, 416-429, 410, 419	12
Arts Elective	6
Total	32

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² CPSC 124, 126 is highly recommended.

³ PHYS 206 is recommended.

Combined Honours Chemistry and Oceanography

See Oceanography programs.

Combined Honours Chemistry and Physics

See Physics programs.

Honours Chemical Engineering – Chemistry Honours

Chemical Engineering – Chemistry Honours is a program jointly administered by the Departments of Chemical Engineering and Chemistry. Enquiries regarding the program and student advising should be made to the Faculty advisers in either Department. The completion of the B.A.Sc. degree in Chemical Engineering – Chemistry Honours will normally take five years of university study. Entry to the program is normally from First Year Applied Science. To obtain permission to enter the program students must consult the Faculty advisers in the Departments of Chemical Engineering and Chemistry. Details of the program are given in the Applied Science section of the *Calendar*. To complete the program satisfactorily, students must obtain a minimum overall second-class average in their chemistry courses numbered 300 and higher.

Courses

- Primarily for First-Year Students – CHEM 103 is not intended for students in Faculty of Science programs or those planning to enter the Faculty of Applied Science. CHEM 110 or CHEM 121 is the normal prerequisite for admission to science programs. The difference between the two lies in the background of the student: those students with credit for Chemistry 11 only take CHEM 110, whereas those with credit for Chemistry 12 take CHEM 121. Both require MATH 100 as corequisite.

- Primarily for Second-Year Students — Students who have not taken a first-year Chemistry course at the University of British Columbia are assumed to have read "Chemical Principles", Zumdahl, S.S., 2nd Ed., Heath, 1995. Major students planning to take CHEM 312 in third year must take MATH 221 in second year.
- Primarily for Third-Year Students — Honours and Major students are required to take CHEM 311 and either 310 or 335 in third year.
- Primarily for Fourth-Year Students — Honours students are required to take four credits of the integrated laboratory course CHEM 415. Major students are required to take at least two credits of CHEM 415, specifically in the areas of analytical and inorganic chemistry, and may elect to take an additional one or two credits of CHEM 415.
- Laboratory and Tutorial Courses — Students taking any course which has an associated laboratory and/or tutorial must register in these secondary activities in addition to the lecture portion of the course. No exception will be made. If you believe that you may qualify for an exemption from a laboratory (you are repeating the course, have transfer credit from another institution, etc.) you must contact the appropriate laboratory instructor directly. Please note that if you miss the first two laboratory meetings of a course, without having made prior arrangements with the instructor concerned, your registration in the course may be cancelled and your space reallocated to another student as demand requires.

Computer Science (CPSC)

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 programs, see the Faculty of Graduate Studies. All students who intend to take Honours in Computer Science must consult the Head of the Department.

Co-operative Education Program Computer Science

Co-operative Education is a process of education which integrates academic study with related and supervised work experience in co-operating employer organizations.

An optional year-round Co-operative Education Program is available for students in Computer Science. The Program is intended to help prepare interested and qualified students for careers in the computing industry with a minimum of 17.5 months of work placement supervised by practising professionals. Faculty advisers also visit students at their place of work and provide advice on technical reports required of all students in the program.

To be eligible, students must be admitted to the second year of the Computer Science B.Sc. program. Selection of students will be based on academic performance and general suitability to the work environment as determined by resume and interview. The total enrolment will be subject to the availability of appropriate work placements and faculty advisers. The work placements are arranged by mutual agreement between students and employing organizations. Participating students register for CPSC 298, 299, 398, 399, or 499 as appropriate, and pay the Cooperative Education Program fee for each course (see Index for Fees — Special Fees). Graduation in the Co-operative Education Program requires a student to complete each of CPSC 298, 299, 398, 399 and 499, in addition to the normal academic requirements. Students who

complete less than five courses will have each satisfactorily completed course noted on their academic record.

Detailed information on the program can be obtained from the Department of Computer Science or from Co-operative Education Programs, Science/Engineering Physics, room 309 Hennings Bldg., The University of British Columbia, 6224 Agricultural Road, Vancouver, B.C., V6T 1Z1.

Requirements for the B.Sc. Degree

Major and Honours

First Year

Course	Credits
CPSC 124, 126 or CPSC 122, 128 ¹	6
MATH 100, 101 (120, 121)	6
PHYS 100 ² , 101	3-6
CHEM 121 or 110	3-6
ENGL 100-level ³	6
Science Elective	0-6
Total	30

¹ While CPSC 124, 126 are the recommended route for students pursuing a program in Computer Science, CPSC 122, 128 may be taken in their place.

² Students with Physics 12 credit cannot take PHYS 100.

³ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

Major (0376)

Second Year

Course	Credits
CPSC 216, 218, 220	9
MATH 200, 221	6
STAT 241 ⁴	3
Arts Elective	6
Elective ⁵	6
Total	30

Third and Fourth Years

Course	Credits
CPSC 310, 319	6
CPSC 320	3
Other CPSC courses numbered 300 or above	12
Further CPSC courses numbered 400 or above	12
MATH or STAT courses numbered 300 or above ⁶	6
Arts Elective	6
Elective ⁷	15
Total	60

⁴ May be replaced by STAT 200 provided MATH/STAT 302 is included as one of the required MATH or STAT courses in third and fourth year. This alternative is recommended for students with an interest in further STAT courses.

⁵ At least nine credits must be either Science courses outside the field of the Major, or in Arts. The field of the Major in Computer Science is defined as Computer Science, Mathematics and Statistics. The remaining 12 credits may include any course in the Faculties of Arts and Science for which Science credit is granted. Courses from other Faculties may be taken with prior approval of the Department. Departmental approval is automatically granted for the following courses from other Faculties: COMM 335, 410, 436, 457, 488, 456, 457, 458; ELEC 256, 359, 360, 455 and 464.

⁶ Mathematics courses in analysis, applied mathematics, linear algebra, probability, and differential equations and Statistics courses are recommended. Such courses include MATH 300, 301, 303, 307, 315, 316, 340, 345, 400, 401, 402, 403, 407, 441, 442 and 443, MATH or STAT 302 and STAT 305, 306, 404 and 405.

Note: Enrolment in Computer Science courses numbered above 200 is controlled by stringent academic admissions criteria. Students should consult the Computer Science Department during the spring or summer to determine the criteria for admission.

Honours (0154)

Second Year

Course	Credits
CPSC 216, 218	6
CPSC 220	3
MATH 200, 220, 221	9
STAT 241 ¹	3
Arts Elective	6
Elective	6
Total	33

Third and Fourth Years

Course	Credits
CPSC 302, 303, 310, 319, 320	15
CPSC 421	3
Other CPSC courses numbered 300 or above ²	21
MATH or STAT courses numbered 300 or above ³	18
Arts Elective	6
Elective ⁴	6
Total	69

¹ May be replaced by STAT 200 provided MATH/STAT 302 is included as one of the required MATH or STAT courses in third and fourth year. This alternative is recommended for students with an interest in further STAT courses.

² CPSC 449 is recommended.

³ Mathematics courses in analysis, applied mathematics, linear algebra, probability, and differential equations and Statistics courses are recommended.

⁴ Courses in logic and foundations of mathematics are recommended.

Combined Honours (0021) Computer Science and Mathematics (CPSC, MATH)

First Year

Course	Credits
ENGL 100-level ¹	6
MATH 120, 121 (100, 101)	6
CHEM 110 or 120	6
PHYS 110, 115 or 120	6
CPSC 124 and 126 or CPSC 122, 128 ²	6
Total	30

Second Year

Course	Credits
CPSC 216, 218, 220	9
MATH 223 ³ , 226, 227, 215	12
Arts Elective	6
Elective	6
Total	33

Third Year

Course	Credits
CPSC 302 ⁴ , 303 ⁵ , 310, 319, 320	15
CPSC courses numbered 300 or above	3
MATH 310, 320, 321	9
Six credits from MATH 300, 301, 322, 323, 331	6
Electives	3
Total	36

Fourth Year

Course	Credits
CPSC 421	3
CPSC courses numbered 300 and above	6
Twelve credits from MATH 400-403, 416-429, 410, 449; CPSC 402, 403	12
Arts Elective	6
Elective	6
Total	33

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² While CPSC 124, 126 are the recommended route for students pursuing a program in Computer Science, CPSC 122, 128 may be taken in their place.

³ May be replaced by MATH 221.

⁴ May be deferred to the following year.

**Combined Honours (0138)
Computer Science and Physics
(CPSC, PHYS)**

First Year

A¹ for Honours Physics, but in lieu of the "Arts Elective" CPSC 124 and 126 or CPSC 122, 128 (6).

Second Year

PHYS 200, 206	6
PHYS 205, 209	6
MATH 200, 221, 215	9
CPSC 216, 218	6
Elective ^{1,2}	6
Total	33

Third Year

PHYS 301, 304	6
PHYS 303, 306	6
PHYS 309	6
CPSC 302, 303	6
CPSC 220	3
CPSC 310, 319 ³	6
MATH 316	3
Total	36

Fourth Year

PHYS 307	2
PHYS 308, 302	6
PHYS 349	6
CPSC 402 or 403	3
Additional CPSC (as per consultation)	12
Arts Elective	6
Total	35

¹ It is recommended that MATH 317 be taken in the second term of the second year.

² A total of 18 credits of Arts (including first-year English) is required.

³ CPSC 319 can be postponed to the fourth year.

**Major
Mathematical Sciences**

(Offered with Departments of Mathematics and Statistics.)

See Mathematics programs.

**Environmental Sciences
(ENSC)**

Several Departments in the Faculty of Science offer environmentally focused options within their B.Sc. Major programs. These options are designed to address the contemporary need for people with a solid background in a particular scientific discipline, together with a knowledge of other areas pertinent to the environment. Students interested in these programs should consult the listings for Biology, Chemistry, Geography, Geological Sciences, and Microbiology in this section of the *Calendar*.

The Faculty also offers a B.Sc. Honours Program, in Environmental Sciences, designed to give students a broad perspective on the environment. It provides a significant background in chemistry, earth and ocean sciences, life sciences and social sciences and through a series of Environmental Studies seminars, examines environmental problems through an understanding of what each of the disciplines can contribute to solving such problems. The Environmental Sciences Honours Program concentrates more on an understanding and appreciation of the major environmental issues facing human societies than on training in a specific discipline, and it adopts an integrative cross-disciplinary approach to the study of these issues. The Program is not specifically intended as a preparation for post-graduate work in traditional scientific disciplines without additional qualifying studies. However it will provide an excellent preparation for post-

baccalaureate environmental and resource management programs.

Enrolment in the second and subsequent years of the Program is strictly limited to 24 students in each year and is controlled by stringent academic criteria. Admission to second year will be based on academic performance in first year and will require a minimum 72% average (B) in that year. However, attainment of this minimum average does not guarantee acceptance into the Program. Students must maintain at least a 68% average (B-) for continuation after second year.

Students who do not meet the required standards for continuation, or who choose to change programs after second or third year, can complete a General Science degree with concentrations in any one of Chemistry, Earth Science or Life Science without penalty. Transfer to a Major program after second year may result in some deficiencies in program requirements and a need for additional course work.

Second year of the program, including ENVR 200, will be implemented in the 1995/96 session. For additional program information, consult the Office of the Dean of Science.

Requirements for the B.Sc. Degree

Honours (0589)

First Year¹

Course	Credits
BIOL 110 or 115 ²	0-3
BIOL 120 ³	3
CHEM 121, 122 (110)	6
MATH 100, 101 (120, 121)	6
PHYS 101 (121)	6-3
ENGL 100-level	6
Elective	3-0
Total	30

Second Year

Course	Credits
BIOL 302	3
BIOL 303	3
CHEM 201, 202 (205)	6
MATH 200	3
MICB 201	3
SOIL 200, ATSC/GEOG 200	6
ENVR 200	3
Arts Electives ^{1,4}	6
Science Electives ^{5,6}	3
Total	36

Third Year

Course	Credits
CHEM 301	3
GEOG 205	3
GEOG 310	3
ATSC/GEOG 300	3
OCGY 308	3
STAT 200	3
Arts Electives ^{1,4}	6
Science Electives ^{6,7}	9
ENVR 300	3
Total	36

Fourth Year

Course	Credits
ENVR 400	6
PHIL 435	3
Arts Electives ^{1,4}	9
Science Electives ^{6,7}	12
Total	30

¹ Students eligible to enrol in Science One (21 credits) are encouraged to do so. Science One will satisfy first-year requirements in Biology, Chemistry, Mathematics and Physics. Students in Science One must also include a three-credit elective in first year, and may wish to consider an Earth Science course at this point (ERTH 100, GEOG 103, GEOL 100 or GEOP 120).

² BIOL 120 is required of all students. Students with at least 80% in Biology 12 are not required to take BIOL 110 or 115 and instead are encouraged to take a three-credit elective. One of ERTH 100, GEOG 103, GEOL 100 or GEOP 120 is recommended.

³ Recommended Arts electives: ANTH 220 (3), 301 (3), 329 (6); ECON 100 (6), 309 (6), 371 (3), 471 (3), 472 (3); GEOG 200 (3), 362 (3), 363 (3), 423 (3), 461 (3); PHIL 313 (3), 401 (3); POLI 200 (3), 260 (3), 302 (3), 404 (3/6); PSYC 100 (6), 321 (6); SOCI 100 (6), 210 (3/6), 260 (3/6), 301 (3), 360 (3), 411 (3).

⁴ With permission, up to six credits of Arts electives may be replaced by six credits chosen from the following list: CONS 200 (3), 330 (3), 430 (3), 440 (3); GEOG 210 (3), 315 (3), 373 (3), 410 (3), 415 (3), 418 (3), 472 (3); LAW 356 (2-3), 358 (2), 359 (2), 362 (2), 388 (2); OCCH 401 (3).

⁵ Students interested in the Computer Modelling Concentration should take CPSC 122 in the second year. Students interested in Life Sciences Concentration should consider one of BIOL 204, 205, 209 or 210 in the second year.

⁶ Areas of concentration. A minimum 15 science credits must be taken from one of the following groups. Courses with asterisks are required for that area of concentration.

Chemical analysis of the environment: CHEM 230 (6), *302 (3), 305 (6), 311 (4), 315 or 330 (6), 310 or 335 (6); GEOG 323 (3), *342 (3), 412 (3), *443 (3), 444 (3); GEOP 230 (3); OCGY 407 (3), 410 (3); SOIL 304 (3).

Physical analysis of the environment: CPSC 122 (3); GEOG 306 (3), 308 (3); GEOG 323 (3), *342 (3), 443 (3); GEOP *230 (3), *360 (3), 301 (3); MATH 215 (3), 221 (3); OCGY 405 (3), 410 (3); SOIL 301 (3), 315 (3).

The atmosphere and water: CHEM *302 (3); GEOG *300 (3), 401 (3), 402 (3), 403 (3); GEOG 323 (3), *342 (3), 442 (3), 443 (3), 444 (3); MATH 215 (3), 221 (3); SOIL 435 (3).

Life Sciences, Systematics: BIOL *one of 204, or 205, or 209 or 210 (3), 320 (3), 321 (3), 322 (3), 323 (3), 324 (3), 326 (3), 327 (3), 328 (3), 426 (6); MICB 400 (3).

Life Sciences, Ecology: BIOL *one of 204, or 205, or 209 or 210 (3), 305 (3), 401 (3), 402 (3), 403 (3), 406 (3), 407 (3), 409 (3), 411 (3), 412 (3), 413 (3), 418 (3), 419 (3), 434 (3); MICB 400 (3); MRNE 430 (3).

Conservation Biology: BIOL *one of 204, or 205, or 209 or 210 (3), 403 (3), 404 (3), 408 (6), 416 (3), 427 (3); PRST 387 (3), 395 (3), 403 (3), 405 (3); MICB 400 (3); OCGY 309 (3), 410 (3); PLNT 404 (3).

Computer Modeling: BIOL 403 (3), 404 (3), 408 (6); CPSC *122 (3), *128 (3), *216 (3), *405 (3), 435 (3); GEOG 403 (3); MATH 215 (3), 221 (3); OCGY 410 (3); PLNT 404 (3); STAT *241 (3).

⁷ Additional third and fourth year earth science electives, four credits chosen from the above list of courses, but outside area of concentration. Students who chose computer modelling concentration can complete their electives using any of the listed courses.

**Freshwater Science
(FWSC)**

The Division of Mathematics and Science of Okanagan University College offers a B.Sc. Major Program in Freshwater Science, with the degree being granted through the University of British Columbia. Because of the relationships between water and nearly every other aspect of the natural environment, the Freshwater Science Program includes several fields of study, principally biology, chemistry, geography, geology, hydrology and climatology. Two courses, FWSC 300 and 400, are designed to synthesize and integrate knowledge and skills in biology, chemistry and earth sciences, and to apply critical-thinking skills to complex problems.

The Program provides an understanding of freshwater, its behaviour, origin, distribution and circulation below, on and above the land, its chemical and physical properties, its relationship to water quality, the organisms living in water and the health of aquatic ecosystems, and its interaction with the physical environment. Students will gain a broad understanding of integrated water resource management and the impacts of human activities on the resource.

The Freshwater Science Program is not intended as preparation for post-graduate studies in traditional scientific disciplines without additional qualifying studies. However, it will prepare students for more applied post-

baccalaureate resource management and environmental programs offered by several other universities, and will provide graduates with both flexibility and adaptability in choosing careers.

This program is available only at Okanagan University College. For additional program information, contact the Office of the Dean, Division of Mathematics and Science, Okanagan University College, North Kelowna Campus, 3333 College Way, Kelowna, B.C., V1V 1V7.

Geography (GEOG)

The Department offers opportunities for study leading to bachelor's, master's and doctoral degrees. For information on the Ph.D., M.A. and M.Sc. degree programs, see the Faculty of Graduate Studies. For information on the B.A. degree program, see the Faculty of Arts.

Requirements for the B.Sc. Degree

Students entering the Major, Honours or a Combined Honours program must consult the science adviser of the Department of Geography.

Students registered in the B.Sc. Geography program must take at least six credits of Arts courses outside the Department of Geography in addition to ENGL 100-level.

The following Geography courses may be used as free electives, with due regard to prerequisites. They may not be used for either Science or Arts 'designated' credit: GEOG 210, 310, 315, 316, 317, 318, 319, 370, 371, 374, 375, 410, 417, 418, 445.

Major (0216)

Physical Geography (PGEO)

First Year

ENGL 100-level ¹	6
MATH 100, 101 (120,121)	6
PHYS 121, 122 (101,102) ²	6
CHEM 121, 122 (110)	6
GEOG 101 (102,103) ⁴	6
Total	30

Second Year

GEOG 200, 205, 207	9
One of GEOG 121, 122, 290	3
STAT 200, MATH 200	6
CPSC 122	3
Science Electives ⁵	6
Arts Elective	3
Total	30

Third Year

GEOG 300, 306, 309 ⁶ , 310	12
GEOG 372 or 373	3
SOIL 200 or OCGY 308	3
Arts Elective ⁷	6
Electives ⁸	6
Total	30

Fourth Year

Two of GEOG 308, 405, 406, 408	6
Two of GEOG 303, 401, 402, 403	6
Two of GEOG 315, 316, 317, 410, 415, 417, 418, PHIL 417	12
Electives ⁹	6
Total	30

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without Physics 12 must take PHYS 100 prior to PHYS 101 or 121. Such students should then take PHYS 102(122) in the second year.

³ Special arrangements may be made for students unable to take this course in first year.

⁴ Chosen from BIOL 100-level, CHEM 201 or 208, GEOP 230, 231.

⁵ Field Course taken in May of the third year; extra fee to be paid.

⁶ ENGL 301 is recommended.

⁷ Enough elective credits must be numbered 300 or higher so that the total 300-level or higher courses in the program, including specified courses, is at least 48 credits. Nine credits of Science courses must be from outside the Major field, or Arts. The Major field for this program includes all courses in Geography.

Honours (0568) Climatology (CLIM)

First Year

Course	Credits
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 121, 122 (101, 102) ²	6
CHEM 121, 122 (110)	6
GEOG 101 (102, 103) ⁴	6
Total	30

Second Year

Course	Credits
ATSC/GEOG 200, 300	6
GEOG 205	3
MATH 200, 221	6
GEOP 230, 231	6
CPSC 122	3
Arts Elective ⁵	6
Total	30

Third Year

Course	Credits
ATSC/GEOG 301, 302, 303	9
GEOG 309 ⁶ , 310	6
OCGY 308	3
MATH 215 and PHYS 312	6
PHYS 314 or GEOP 322	3
STAT 200	3
Arts Elective ⁷	3
Elective	3
Total	36

Fourth Year

Course	Credits
GEOG 449	3
Two of GEOG 401, 402, 403	6
GEOG 472	3
Three of OCGY 401, SOIL 314, CHEM 302 ⁸	9
ATSC 411, 414, 412	9
ATSC 440	3
Arts Elective ⁹	3
Elective	9
Total	36

¹ ENGL 112 is recommended. Suitably qualified students are encouraged to take ENGL 121/122. Three credits of English may be delayed until second year.

² Students without Physics 12 must take PHYS 100 prior to PHYS 101 or 121. Such students then take PHYS 102(122) in the second year.

³ Special arrangements can be made for students who have been unable to take this course in first year.

⁴ ENGL 301 is recommended.

⁵ Field Course taken in May of third year.

⁶ CHEM 201 is prerequisite to this course.

Combined Honours (2278) Geography and Geology (GEOG, GEOL)

First Year

Course	Credits
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 121, 122 (101, 102) ²	6
CHEM 121, 122 (110)	6
CPSC 100-level	3
GEOG 103 or GEOL 100 or GEOP 120	3
Total	30

Second Year

Course	Credits
GEOG 200, 205	6
GEOL 200, 202, 205, 235 ³	12
GEOL 251 or GEOG 306	3

MATH 200, 221	6
GEOP 230	3
Electives ⁴	6
Total	36

Third Year

Course	Credits
GEOG 308, 309 ⁵	6
GEOL 307, 312	6
GEOG 373 or 472	3
FOPR 363	3
MATH 215, STAT 200	6
Arts Elective ⁶	6
Elective ⁷	3
Total	33

Fourth Year

Course	Credits
Two of: GEOG 405, 406, 408	6
GEOL 301, 462	6
GEOG 449 or GEOL 449	6
Arts Elective	6
Elective ⁸	9
Total	33

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without Physics 12 must take PHYS 100 prior to PHYS 101 (121). Such students then take PHYS 102 (122) in the second year.

³ Field course given in May; extra fee to be paid.

⁴ English 301 is recommended.

⁵ Electives in the second, third and fourth years combined must include at least nine credits of courses numbered 300 or above. Students should consult the course guides available from the the Geography or Geological Sciences departments.

Geological Sciences (GEOL)

Three undergraduate geology degrees are offered: B.Sc. (honours), B.Sc. (major) and B.A.Sc. (For information on the Ph.D. and M.Sc. degree programs, see the Faculty of Graduate Studies). The Honours program is the recommended program for science students who wish to undertake graduate study or pursue a professional career in the geological sciences. Entrance into the Honours program is normally before the beginning of the third year. The Major program is available for students who have a general interest in geology and do not intend to pursue a professional career in the discipline. The Geological Engineering program leads to the B.A.Sc. and is the professional program in engineering. Further information on the B.A.Sc. program may be found in the Applied Science section of the *Calendar*.

Students who desire to register as Professional Geoscientists after graduating should contact the Association of Professional Engineers and Geoscientists of British Columbia to ascertain course and other requirements.

Students interested in environmental science may pursue this within Geology Honours (stream 1 below) or in a combined honours program such as Geology-Oceanography, Hydrogeology-Soil Science, Geology-Chemistry.

One of Geol 100 or 150, EARTH 100, GEOP 120 or GEOG 101 or 103 is normally prerequisite for all other courses in geology except GEOL 310, 312 and 313.

Elective courses in Geological Sciences are arranged in four streams: (1) environmental geology; (2) sedimentary geology and geobiology; (3) crustal and mantle processes; (4) mineral deposits. Students should consult *The Geological Sciences Program Guide* (available from the departmental office) and can get guidance from a Departmental Adviser when formulating their program.

Students taking Geology courses may be required to participate in field trips.

Requirements for the B.Sc. Degree

Major (0073)

First Year

Course	Credits
GEOL 100 (ERTH 100, GEOP 120)	3
CHEM 121, 122 (110)	6
PHYS 100-level	6
MATH 100, 101 (120, 121)	6
CPSC 100-level	3
ENGL 100-level ¹	6
Total	30

Second Year

Course	Credits
GEOL 200, 202	6
GEOL 205, 235 ²	6
CHEM 208	6
Science Elective ³	6
Arts electives ⁴	6
Total	30

Third and Fourth Years

Course	Credits
Geology Courses numbered 300 and above	30
Science Electives other than Geology ⁵	9
Electives ⁶	15
Arts electives ⁷	6
Total	60

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Includes a field trip in May of second year.

³ At least 18 elective credits must be for courses numbered 300 or above; at least 12 elective credits must be from Science courses other than Geology.

⁴ At least nine credits must be chosen from courses offered by the Faculties of Science and Arts outside the field of the Major. The field of the Major constitutes all courses offered by the Departments of Geological Sciences, Geography, Oceanography and Geophysics and Astronomy.

Honours (0462)

First Year

Course	Credits
GEOL 100 (ERTH 100, GEOP 120)	3
CHEM 121, 122 (110)	6
PHYS 100-level	6
MATH 100, 101 (120, 121)	6
CPSC 100-level	3
ENGL 100-level ¹	6
Total	30

Second Year

Course	Credits
GEOL 200, 202, 205, 235 ² , 251	15
MATH 200	3
MATH 221 or STAT 200	3
CHEM 208	6
Arts Elective	6
Elective	3
Total	36

Third and Fourth Years

Course	Credits
Two of GEOL 301, 302, 303	6
GEOL 307, 323, 335 ³ , 425	12
GEOL 499	6
GEOP 230	3
Arts Electives	6
Electives ⁴	33
Total	66

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Includes a Field School in May after Second Year.

³ Field School in May after Third Year.

⁴ At least 12 elective credits must be from Geology courses numbered 300 or above; at least 12 elective credits must be Science other than Geology. At least 48 total credits must be numbered 300 or above.

**Combined Honours (2278)
Geology and Geography
Honours (GEOL, GEOG)**

See Geography programs.

**Combined Honours (0065)
Geology and Geophysics
(GEOL, GEOP)**

First Year

Course	Credits
GEOL 100 or GEOP 120	3
CHEM 121, 122 (110)	6
PHYS 121, 122 (301, 102) ²	6
MATH 100, 101 (120, 121)	6
CPSC 100-level	3
ENGL 100-level ¹	6
Total	30

Second Year

Course	Credits
GEOL 200, 202, 205, 251	12
GEOP 230, 231, 232	9
MATH 200, 221	6
PHYS 209	3
Arts Elective	3
Total	33

Third Year

Course	Credits
One of GEOL 302, 303	3
GEOL 307	3
GEOP 320, 321, 322	9
MATH 215, 316, 317	9
PHYS 311, 319	6
Arts Elective	6
Total	36

Fourth Year

Course	Credits
GEOL 425	3
GEOP 420, 421, 426	12
GEOP 499 or GEOP 49	6
Electives	9
Arts Elective	3
Total	33

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year. Students in this program prior to 1993 should follow the 1992 *Calendar* and consult with a Geological Sciences adviser when substitute geology courses are required.

² Students without Physics 12 should consult the Departmental adviser as early as possible. Normally those students must take PHYS 100 prior to PHYS 101 or 121.

**Combined Honours
Geology and Oceanography**

See Oceanography programs.

**Combined Honours
Geology and Another Subject
(GEOL)**

First Year

Course	Credits
MATH 100, 101 (120, 121)	6
CHEM 121, 122 (110)	6
PHYS 100-level	6
CPSC 100-level	3
GEOL 100 (ERTH 100, GEOP 120) ¹	3
ENGL 100-level ²	6
Total	30

Second Year

Course	Credits
MATH 200	3
MATH 221 or STAT 200	3

GEOL 200, 202, 205	9
GEOL 235	3
Additional credits in consultation with other department	12
Total	30

Third Year

Course	Credits
Geology credits numbered 300 and above	12
Additional credits in other department	12
Additional credits in consultation with other department	6
Arts Elective	6
Total	36

Fourth Year

Course	Credits
GEOL 499 or other department 499	6
GEOL 335	3
Geology courses numbered 300 and above	9
Additional credits in other department	12
Arts Elective	6
Total	36

¹ May be waived in certain circumstances.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

Note: Timetabling and other problems may not permit programs in Geology and certain other departments. Students planning careers in Geological Sciences should consult the Departmental adviser for elective courses appropriate to their interests.

**Combined Honours (0708)
Hydrogeology and Soil Science
(HYGL, SOIL)**

First Year

Course	Credits
GEOL 100 (ERTH 100, GEOP 120) ²	3
CHEM 121, 122 (110)	6
PHYS 100-level	6
MATH 100, 101 (120, 121)	6
BIOL 100 level	3
ENGL 100-level ¹	3
CPSC 100-level	3
Total	30

Second Year

Course	Credits
GEOL 200, 202, 256	9
CHEM 208 (205)	6
MATH 200	3
SOIL 200, 204	6
Arts Elective	3
ENGL 100 level	3
GEOG 205	3
Total	36

Third and Fourth Years

Course	Credits
GEOL 301, 307, 323, 342	12
GEOL 251	3
GEOL 499 or SOIL 499	6
GEOG 309	3
SOIL 304, 313, 321, 417	12
Electives ^{3, 5}	12
MATH 221	3
STAT 200	3
GEOL 412, 443	6
Arts Electives	9
Total	69

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² May be waived in certain circumstances.

³ Strongly recommended electives: GEOL 444, SOIL 308, 435.

⁴ Recommended electives: SOIL 314, 416, 433, 442, 443, 446, GEOP 300, MATH 215, MIBC 201.

⁵ GEOP 300 is required for professional registration in geosciences.

Geophysics (GEOP)

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 programs, see the Faculty of Graduate Studies. Astronomy courses offered by the Department are listed under Astronomy. All students who intend to take Honours in Geophysics or Astronomy must consult the Head of the Department.

Requirements for the B.Sc. Degree

Major (0001)

First Year

Course	Credits
GEOP 120	3
CHEM 121, 122, (110)	6
MATH 100, 101, (120, 121)	6
PHYS 100-level	6
Elective ¹	3
ENGL 100-level ²	6
Total	30

Second Year

Course	Credits
GEOP 230 ¹ , 231 ¹ , 232	9
MATH 200, 221, 215	9
ELEC 203 or PHYS 215	3
Electives ¹	3
Arts Elective	6
Total	30

Third Year

Course	Credits
GEPA 316 or 317	3
GEOP 320, 321, 322	9
MATH 317	3
PHYS 311	3
PHYS 312 or MATH 316	3
Elective ¹	9
Total	30

Fourth Year

Course	Credits
GEOP 420, 421, 426	12
Arts Elective	6
Elective ¹	12
Total	30

¹ Recommended: CPSC 122 or 152, ASTR 101, GEOL 100.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ Students entering third year who have not completed these courses should consult with the department for allowable physics/mathematics alternatives.

⁴ Recommended: CPSC 122 or 152.

For the electives available in third and fourth years at least three credits of Geology at the 200 level or above are required. At least nine credits must be from outside the field of the Major. The field of the Major consists of all courses in GEOP, ASTR, GEPA, GEOL, PHYS and MATH.

Honours (0380)

Geophysics is an interdisciplinary physical science concerned with the nature of the earth and its environment and as such seeks to apply the knowledge and techniques of physics, mathematics and chemistry to understand the structure and dynamic behaviour of the earth and its environment. The required sequence of mathematics, physics and geophysics courses is designed to provide a basic structure on which to build a coherent honours program with science electives normally selected from geophysics, geology, astronomy, oceanography, mathematics, physics and chemistry.

First Year

Course	Credits
GEOP 120	3
CHEM 121, 122, (110)	6
MATH 100, 101, (120, 121)	6
PHYS 121, 122, (101, 102) ¹	6
ENGL 100-level ²	6
Elective ³	3
Total	30

Second Year

Course	Credits
CPSC 122 or 152	3
MATH 200, 221, 215	9
PHYS 203, 209	6
Electives ¹	18
Total	36

Third and Fourth Years

Course	Credits
MATH 317	3
MATH 316 (PHYS 312)	3
PHYS 301, 309	7
GEOP 426 or GEPA 316/317	3-6
GEOP 320, 321, 322	9
GEOP 419 (or equivalent)	6
Electives ¹	35-32
Total	66

¹ Students without Physics 12 should consult departmental adviser as early as practical. Normally they must take PHYS 100 prior to PHYS 101 or 121.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ Strongly recommended: ASTR 101 or GEOL 100.

⁴ The electives of years 2 to 4 must contain 12 credits of Arts and six credits of Geology. The remaining electives must form a coherent program to be approved by the departmental undergraduate committee. Sample programs in which the emphasis of the electives varies (e.g. geology, solid earth geophysics, astronomy, oceanography) are available from the department.

Honours

Astronomy and Geophysics— Focus Planetary Sciences

See Astronomy Programs.

Combined Honours Geology and Geophysics

See Geological Sciences programs.

Combined Honours Geophysics and Oceanography

See Oceanography programs.

Mathematics (MATH)

The Department offers opportunities for study leading to doctoral, master's and bachelor's degrees. For information on the B.A. degree programs, see the Faculty of Arts. For information on the Ph.D., M.A., and M.Sc. degree programs, see the Faculty of Graduate Studies.

The student should note that the first digit in the number of a course is intended to convey the level of mathematical maturity at which the course is conducted rather than the year in which it must be taken.

A student wishing to enter a third-year course must have obtained a grade of 51% or better in prerequisite second-year courses.

Requirements for the B.Sc. Degree

Major programs

The department offers a large selection of courses in various areas of pure and applied mathematics and requiring various levels of mathematical sophistication. The student is advised to consult a Mathematics adviser during the second year or when considering becoming a Mathematics Major in order to design a coherent program of study suitable to the student's interests and abilities.

Major (0456) Mathematics

First Year

Course	Credits
MATH 100, 101 (or 120, 121) ¹	6
PHYS 100-level	6
CHEM 121 or 110	3-6
ENGL 100-level ²	6
Computing requirement ³	3-6
Elective(s) ^{4,5}	0-6
Total	30

Second Year

Course	Credits
MATH 200 (or 226)	3
MATH 220 ⁶	3
MATH 221 (or 223), 215 ⁷	6
Arts Elective(s)	6
Elective(s) ^{1,5}	12
Total⁸	30

Third and Fourth Years

Course	Credits
Mathematics courses numbered 300 or above ⁹	24
MATH, STAT, or CPSC courses numbered 300 or above ⁵	6
Arts Elective	6
Electives ^{1,5}	24
Total	60

¹ See the announcement in the Admissions section of the *Calendar* regarding credit for secondary school calculus courses.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ One of these sequences must be completed, but may be delayed until the second year:

CPSC 122
CPSC 124/126
CPSC 128

Computer Science 12 or any three credits of 100-level Computer Science, together with Mathematics 210.

⁴ Enough elective credits must be numbered 300 or higher so that the total 300-level or higher courses in the program, including specified courses, is at least 48 credits.

⁵ At least nine credits must be outside the field of major, the field of major comprising MATH, STAT and CPSC courses.

⁶ Students obtaining 68% in MATH 226 are not required to take MATH 220.

⁷ MATH 215 may be deferred until third year.

Recommendations

- 1) Mathematically able students are encouraged to take the honours stream MATH 120, 121, 223, 226 and 227.
- 2) Anyone wishing to take higher level courses in Computer Science, including courses in numerical computation, must complete CPSC 122, CPSC 124/126 or CPSC 128. In fact most higher level courses in CPSC, which may very well be useful to Mathematics students, require CPSC 124/126 or CPSC 128.
- 3) In second year, MATH 221 should be taken in first term. It is possible to take (with appropriate prerequisites) some of MATH 307, 308, 312, 317, 340 and MATH/STAT 302 (as well as MATH 300) in the second year.
- 4) Students interested in pursuing statistics to some depth should take STAT 200 and MATH/STAT 302 in

the second year. This will prepare them for more advanced Statistics courses such as STAT 305, 306, 404 and 405.

- 5) Students interested in combining Computer Science, Mathematics and Statistics should consider the Mathematical Sciences program offered jointly with the Departments of Computer Science and Statistics.
- 6) Major students should consider taking some of MATH 300, 320, 322.
- 7) MATH 302 and MATH 307 are courses which are useful in many areas of mathematics.
- 8) Students interested in operations research should take MATH 340, 441, 442 and 443. They are also advised to take MATH 303, STAT 305 and 306, and some advanced Computer Science courses.
- 9) Students interested in teaching are advised to take MATH 308, 309, 312, 313, 446.
- 10) Students interested in becoming actuaries can make substantial progress toward this career goal while majoring in mathematics or statistics. These students should consult the Actuarial advisers in the Mathematics and/or Statistics Departments for detailed advice on course selection and advice on taking the Society of Actuaries' exams.
- 11) Students interested in the physical sciences should take MATH 317 which is important for MATH 300, 316.
- 12) Students interested in Economics should consider taking ECON 420 and 421, and should consult an adviser in the Economics Department for other appropriate Economics courses.
- 13) In selecting electives, students should consider pursuing an area of application of mathematics in some depth. They should also ensure that they fulfil all the graduation requirements of their Faculty.

Major (0185) Mathematical Sciences (MASC)

(Offered with Departments of Computer Science and Statistics.)

First Year

Course	Credits
CPSC 124, 126, or CPSC 122, 128	3-6
MATH 100, 101 (120, 121)	6
PHYS 100-level	6
CHEM 110 or 121	3-6
ENGL 100-level ¹	6
Elective	0-3
Total	30

Second Year

Course	Credits
MATH 200, 220, 221	9
CPSC 216, 220	6
MATH/STAT 302	3
STAT 200	3
Arts Elective	6
Elective ¹	3
Total	30

Third and Fourth Years

Course	Credits
MATH 303 ² , 307, 215, 340	12
Five courses from CPSC 218, 302, 303, 310, 319, 320	15
STAT 305, 306, 404	9
Arts Elective	6
Electives ³	18
Total	60

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² MATH 418 may be substituted.

³ Enough elective credits must be numbered 300 or higher so that the total 300-level or higher courses in the program, including specified courses, is at least 48 credits; at least nine credits must be outside the field of major, the field of major comprising MATH, STAT and CPSC courses.

Honours Programs

Students planning to take an Honours degree in Mathematics, Applied Mathematics or Mathematics combined with another subject, please note the following:

- 1) Students are required to formulate a program of study at the beginning of second year (to be updated each year). The program must be approved by an Honours adviser.
- 2) To be admitted into an Honours Mathematics program, a student must obtain at least 68% in MATH 121 or at least 80% in MATH 101 and an 80% average in MATH 100/101. To remain in Honours Mathematics, a student must maintain an overall 68% average.
- 3) The following Mathematics courses are intended primarily for Honours students in Mathematics and other fields: MATH 120, 121, 220, 223, 226, 227, 300, 301, 320-323, 331, 400-403, 416-429, 440.
- 4) Students are encouraged to choose electives that result in studying another subject to substantial depth.
- 5) For students who plan to work in Mathematics, study in French, German, or Russian is recommended.

Honours (0166) Mathematics

First Year

Course	Credits
MATH 120, 121 (100, 101)	6
PHYS 121, 122 (or 100 level)	6
CHEM 121 (110)	3-6
ENGL 100-level ¹	6
Elective ²	6-9
Total	30

Second Year

Course	Credits
MATH 223 or 221	3
MATH 226 or 200 ³	3
MATH 227 or 317	3
MATH 220 ⁴	3
MATH 215 ⁴	3
Computing requirement ⁵	3-6
Arts Elective	6
Electives ⁶	9-12
Total	36

Third and Fourth Years

Course	Credits
MATH 300, 320, 321, 322, 323 ⁷	15
Fifteen credits from ⁸ MATH 400-403, 416-429, 440, 449 ⁹	15
Nine additional credits of Mathematics courses numbered 300 or above	9
Twelve credits of courses in the Faculty of Science numbered 300 or above ⁹	12
Arts Elective	6
Electives	9
Total	66

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² It may be convenient to take the initial part of the computing requirement at this stage.

³ Students obtaining a 68% in MATH 226 are not required to take MATH 220.

⁴ May be deferred until the third year.

⁵ The same as the computing requirement for majors. See note (2) under the Mathematics Major (0456).

⁶ PHYS 206 highly recommended as well as completion of PHYS 122 or 102.

⁷ A 68% overall average is required in these 30 credits to obtain an Honours degree.

⁸ MATH 449 is highly recommended.

⁹ PHYS 301, 304; CPSC 302, 303; STAT 406 are recommended.

Honours (0390) Applied Mathematics (MAAP, 2nd year)

First Year

Same as Honours Mathematics¹

Second Year

Same as Honours Mathematics except: Electives ²	6-9
Total	33

Third Year

Course	Credits
MATH 300, 301, 316, 320, 321	15
MATH courses in area of concentration ³	3-9
Courses in area of application ⁴	0-9
Electives	3
Arts Elective	6
Total	33-36

Fourth Year

Course	Credits
MATH courses in area of concentration	12-15
Restricted Electives	9-12
Courses in area of application	3-12
Electives ²	0-6
Total	36-33

Appropriate Concentration Courses and Restricted Fourth Year Electives

Applied Analysis Option (APPA 463)

- Third Year — CPSC 302, 303 PHYS 306.
- Fourth Year — MATH 400, 401, 402, 403.
- Restricted Electives — Six credits from MATH 307, 407, CPSC 402, 403; Six credits from STAT 305/306, 406 MATH/STAT 302, MATH 303, 418, 419.

Numerical Analysis Option (NUMA 0190)

- Third Year — MATH 307, CPSC 302, 303 CPSC 402 or 403.
- Fourth Year — MATH 400, 401, 407, CPSC 406 and either STAT 305⁵/306, 406.
- Restricted Electives — Three credits from: MATH 345, or PHYS 306; Six credits from MATH/STAT 302, MATH 303, 418, 419.

Operations Research Option (OPNR 0032)

- Third Year — MATH 340, MATH 441.
- Fourth Year — MATH 402, 403, CPSC 405, 406.
- Restricted Electives — Six credits from MATH/STAT 302, MATH 303, 418, 419, STAT 406; Six credits from MATH 307, 407, 420, 421 and at most one Statistics course numbered 400 or above.

Statistics Option (STAT 0439)

- Third Year — STAT 305⁶.
- Fourth Year — STAT 406, MATH 418, 419.
- Restricted Electives — 12 credits from STAT 306, 404, MATH 303, 400, 401, 402, 403, 420, 421.

Special choices of concentration courses and electives may be arranged subject to the approval of the Head of the Department of Mathematics.

¹ Except that one of CPSC 122 or CPSC 124/126 or CPSC 128 is a prerequisite for third year CPSC courses.

² The electives need to be chosen with care, since the required courses in the area of application will have second-year prerequisites.

³ The area of concentration may be Applied Analysis, Numerical Analysis, Operations Research, or Statistics.

⁴ The area of application can be Economics, a field of Science, or a branch of Engineering. It may not be Mathematics, Computer Science, or Statistics. A total of 12 credits of courses numbered 300 or above must be taken in one area of application.

⁵ STAT 200 and MATH STAT 302 are prerequisite for STAT 305. Students planning to take several Statistics courses should consider taking both courses in the second year.

Combined Honours Mathematics with Another Subject

First Year

Same as Mathematics Honours.

Second Year

Same as Mathematics Honours.

Third and Fourth Years

Course	Credits
MATH 320, 321 ¹	6
Nine credits from ¹ MATH 300, 301, 316, 322, 323, 331	9
Twelve credits from ¹ MATH 400-403, 416-429, 440, 449	12
Arts Elective	6
Electives ²	33
Total	66

¹ A 68% overall average is required in these 27 credits to obtain an Honours Mathematics degree.

² Including courses as specified by the other Department, but not exceeding 30 credits in third and fourth year.

Microbiology (MICB)

The Department of Microbiology and Immunology offers opportunities for study leading to doctoral, master's and bachelor's degrees. For information on the Ph.D. and M.Sc. degree programs, see the Faculty of Graduate Studies. The department offers two options leading to a B.Sc. degree. Option A is a broadly based B.Sc. program and includes aspects of molecular microbial genetics and immunology. Option B emphasizes environmental microbiology and allows the possibility of a further degree of specialization by including relevant courses from other areas. All students who intend to take Honours in either Microbiology option must consult the Head of the Department and the undergraduate adviser.

Co-operative Education Program: Biotechnology in Microbiology and Immunology

This optional program integrates academic study with related and supervised work experience. Enrolment is limited. Admissibility to third-year Microbiology and Immunology B.Sc. program is prerequisite for admission. Detailed information is available from the Department of Microbiology and Immunology or the Office of Co-operative Education (Hennings 309).

Requirements for the B.Sc. Degree

Option A: Major (0362)

First Year

Course	Credits
ENGL 100-level ¹	6
BIOL 115 (110) ²	0-3
BIOL 120 ²	3
MATH 100, 101 (120, 121)	6
PHYS ³	6
CHEM 121, 122 (110)	6
Elective	0-3
Total	30

Second Year

Course	Credits
BIOL 200, 201	6

CHEM 230 (203, 213)	6
MICB 201, 202	6
Elective ¹	12
Total	30

Third Year

Course	Credits
BIOC 302, BIOL 335, MICB 302, 321, 324	18

Fourth Year

Course	Credits
MICB 421	3

Third or Fourth Year⁵

Course	Credits
Either MICB 409 or BIOL 334	3
Selections from MICB 307, 318, 400, 401, 402, 403, 408, 409, 410, 418, 419, 430, 448	12
Electives ¹	24
Total	60
Total	120

¹ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² BIOL 110 or 115 is not required for students with a grade of 80% or greater in BIOL 12; the requirement may be replaced with three credits of free electives. BIOL 120 is required.

³ The requirement for six credits of Physics must include PHYS 101 and any other PHYS course available for credit in the Faculty of Science. For students with Physics 12 credit, three credits may be deferred to second year.

⁴ The 36 elective credits must include:

- At least 12 credits of courses numbered 300 or higher.
- At least 12 credits must be from the Faculty of Arts (in addition to the six credits of first-year English).
- Six credits may be taken as courses in any Faculty.
- At least nine credits of courses must be taken outside the field of the major. These credits may be taken as science courses from other Departments in the Faculty of Science or as additional courses from the Faculty of Arts. The field of the Option A major for microbiology is defined by the mandatory named courses in the program, all MICB and BIOL courses and all courses offered for science credit by departments in the Faculty of Medicine.

⁵ In each year, a total of 30 credits, including electives, must be taken.

Honours (0254)

First, Second and Third Years

Same as the Option A Major program.

Fourth Year

MICB 421, 430, 449	15
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Third or Fourth Years¹

Course	Credits
Either MICB 409 or BIOL 334	3
Selections from MICB 307, 318, 400, 401, 402, 403, 408, 410, 419	9
Electives	27
Total	132

¹ In each Winter session of third and fourth years a total of 36 credits, including electives, must be taken.

Option B: Major (0584) Environmental Microbiology

First and Second Year

Same as the Option A Major program.

Third Year

Course	Credits
BIOC 302, BIOL 335, MICB 321, 324	15

Fourth Year

Course	Credits
MICB 400, 401, 409, 410	12

Third or Fourth Years²

Course	Credits
Selections from MICB 421, 430, 448, BIOL 300, 301, 302, 334	9
CHEM 301, OCC1 401, OCGY 308, GEOL 323, 443, SOIL 324	6

Electives ¹	21
Total	60
Total	120

¹ The 35 elective credits in second, third and fourth year must meet the requirements specified in note 4 for the Option A Microbiology program. The field of the Option B major in microbiology is defined by the mandatory named courses in the program, the list of program selections for third and fourth year, all MICB and BIOL courses, and all courses offered for science credit by departments in the Faculty of Medicine.

² In each year a total of 30 credits, including electives, must be taken.

Honours (0586) Environmental Microbiology

Same as the Option B Major program except:

Fourth Year

MICB 400, 401, 409, 410, 430, 449	24
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Third or Fourth Year¹

Selections from MICB 421, BIOL 300, 301, 302, 334, CHEM 301, OCC1 401, OCGY 308, GEOL 323, 443, SOIL 324	6
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Total 132

¹ In each Winter session of third and fourth years a total of 36 credits, including electives, must be taken.

Nutritional Sciences

Several faculties have cooperated to offer a program of study leading to a B.Sc. Major degree in Nutritional Sciences. The program in Nutritional Sciences is specifically intended for those students interested in basic nutritional sciences, who desire preparation for graduate study and research in Nutrition, and for students who plan to proceed to an area of Agricultural or Health Sciences in which a background in nutrition would be of value. All students take required courses in both animal (comparative) and human nutrition, but each student may select additional courses to emphasize one area or the other. For details of the program, please see the entry under the School of Family and Nutritional Sciences in the *Calendar*.

Note: Students enrolled in this program must register in the Faculty of Science, and are subject to all rules and regulations of this Faculty. Before registering for each of the Second, Third and Fourth years of this program, every student must obtain formal program approval from an adviser in either the School of Family and Nutritional Sciences or the Faculty of Agricultural Sciences.

Oceanography (OCGY)

The Department offers opportunities for study leading to doctoral, master's, combined Honours and Fisheries Oceanography bachelor's degrees. For information on the Ph.D. and M.Sc. degree programs, see the Faculty of Graduate Studies.

A non-laboratory general course, OCGY 310, "The Oceans", is offered to second, third and fourth year students who are not in Science, Applied Science and some Education programs. Students intending to register for an undergraduate Oceanography degree must undertake a Combined Honours program with another science, or the Fisheries Oceanography Honours program; a Major degree in Oceanography is not granted. Formal program approval must be obtained from both Departmental Advisers before registering in second, third and fourth years of the Combined Honours programs. Enrolment in all combined Oceanography Honours and the Fisheries Oceanography Honours programs requires an academic average of 72%.

Requirements for the B.Sc. Degree

**Combined Honours (0535)
Oceanography and Biology
(OCGY, BIOL)**

First Year

Course	Credits
BIOL 110 or 115 ¹	0-3
BIOL 120 ¹	3
CHEM 121, 122 (110)	6
ENGL 100-level ²	6
MATH 100, 101 (120, 121)	6
PHYS 100-level	6
Elective ³	0-3
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
CHEM 230	6
Science Electives ⁴	18
Arts Elective	6
Total	36

Third and Fourth Years

Course	Credits
OCGY 308, 309	6
OCGY 406, 407, 408 ⁵	9
OCGY 449 or BIOL 449 ⁶	6
BIOL 300, 334 and 335 or 434	9
BIOL 302, 303	6
Other BIOL courses numbered 300 or higher	6
Arts Elective	6
Oceanography Electives ⁷	0 or 6
Science Electives ^{8,9}	18 or 12
Total	66

¹ Students with at least 80% in BIOL 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of 100-level Arts or Science courses or 200-level BIOL courses. BIOL 120 is required for all students.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ GEOL 100, EARTH 100 or GEOP 120, CPSC 124 and 126 (or CPSC 122), or GEOG 103, and 12 to 15 additional credits chosen from BIOL 204, 205, 209, 210; CHEM 205 (201 and 202); MATH 200, 317; MICB 201, 202; PSYC 260; to include at least six credits of courses on organisms, e.g., BIOL 209(3) and BIOL 205(3) or MICB 201(5) and 202 (5).

⁴ MATH 200 is strongly recommended in second or third year. Science electives may include additional Oceanography courses in third and fourth years.

⁵ Strongly recommended that this be taken in third year.

⁶ If BIOL 449 is taken, an additional six credits of Oceanography courses are required as part of the science electives.

**Combined Honours (0577)
Fisheries Oceanography**

First Year

Course	Credits
BIOL 110 or 115 ¹	0-3
BIOL 120	3
CHEM 121, 122 (110)	6
ENGL 100-level ²	6
MATH 100, 101 (120, 121)	6
PHYS 100-level	6
Elective ³	0-3
Total	30

Second Year

Course	Credits
BIOL 200, 201	6
BIOL 204, 205	6
CHEM 230	6
Science electives ^{4,5}	12
Arts electives	6
Total	36

Third and Fourth Years

Course	Credits
OCGY 308	3
OCGY 309	3
OCGY 407	3
OCGY 410	3
OCGY 413	3
OCGY 420	3
OCGY or BIOL 449	6
BIOL 300	3
BIOL 301	3
BIOL 303	3
BIOL 408	6
BIOL 426	6
ECON 100	6
LAW 356	3
Arts electives	6
Science electives ⁵	6
Total	66

¹ Students with at least 80% in BIOL 12 are not required to take BIOL 110 or 115 and instead are encouraged to take three credits of 100-level Arts or Science courses or 200-level BIOL courses. BIOL 120 is required of all students.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ One of EARTH 100, GEOL 100, GEOP 120, CPSC 124 and 126 (or 111 and 118), or GEOG 103, and additional credits chosen from BIOL 209, 210; CHEM 205 (201 and 202); MATH 200, 201; MICB 201, 202.

⁴ MATH 200 is strongly recommended in Second or Third year.

⁵ Suggested electives in Oceanography include OCGY 406, OCGY 405, OCGY 415, OCGY 408, OCGY 411; suggested electives in biology include BIOL 302, 334, 325, 320, 326, 332, 353, 402, 404, 405, 428, 429, 434, 435, 445. Also consider BIOE 306, BIOC 302.

**Combined Honours (0287)
Oceanography and Chemistry
(OCGY, CHEM)**

First Year

Course	Credits
CHEM 121, 122 (110)	6
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 100- or 200-level	6
Electives	6
Total	30

Second Year

Course	Credits
CHEM 201, 202 (or 205)	6
CHEM 203	6
MATH 200, 221	6
Science Electives ²	12
Arts Electives	6
Total	36

Third Year

Course	Credits
CHEM 301	3
CHEM 304 (or 305)	6
CHEM 311	4
CHEM 330 (or 313)	6
OCGY 308, 309, 408	9
Science Electives ^{3,4,5}	6
Total	34

Fourth Year

Course	Credits
CHEM 310 (or 335)	6
CHEM 421	2
CHEM elective	3
OCGY 414 ⁶ or 405, 407	6
OCGY 449 or CHEM 449 ⁷	6
Arts Electives	6
Science Elective	3
Total	32

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Must include one of EARTH 100, GEOL 100 or GEOP 120, BIOL 120, CPSC 124 and 126 (or 111 and 118), GEOG 101.

³ Science electives may include additional Oceanography courses. PHYS 312 or MATH 316 is prerequisite to OCGY 414.

⁴ If CHEM 449 is taken, an additional three credits of Oceanography courses are required as part of the science electives.

⁵ Science electives may include additional Oceanography courses in fourth year.

**Combined Honours (0205)
Oceanography and Geology
(OCGY, GEOL)**

First Year

Course	Credits
GEOL 100 or EARTH 100	3
CHEM 121, 122 (110)	6
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 100-level	6
Science Elective ²	3
Total	30

Second Year

Course	Credits
GEOL 200, 202	6
GEOL 205, 235	6
STAT 200	3
MATH 200, 221	6
CHEM 208	6
Electives	9
Total	36

Third Year

Course	Credits
OCGY 308, 309	6
GEOL 301, 302	6
GEOL 307	3
OCGY 408	3
Arts Electives	6
Science Electives	9
Total	33

Fourth Year

Course	Credits
OCGY 405 or 414	3
OCGY 407, 416	6
GEOL 426	3
OCGY 449 or GEOL 449	6
Geology electives ³	6
Science electives ⁴	3
Arts electives	6
Total	33

¹ ENGL 112 recommended. qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Recommended three credits of BIOL or CPSC at the 100-level.

³ Recommended courses include GEOL 303, 309, 323, 342, 403, 405, 421, 442, 443, 444, 446.

⁴ Science electives may include additional Oceanography courses in fourth year.

**Combined Honours (0240)
Oceanography and Geophysics
(OCGY, GEOP)**

First Year

Course	Credits
GEOP 120 or EARTH 100	3
CHEM 121, 122 (110)	6
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 121, 122 (101, 102) ²	6
Science elective	3
Total	30

Second Year

Course	Credits
CPSC 100-level	3
GEOL 200, 256	6

MATH 200, 317	6
MATH 215, 221	6
PHYS 203, 209	6
Arts electives	6
Science elective ¹	5
Total	36

Third Year

Course	Credits
OCGY 308, 309	6
PHYS 303, 309	6
OCGY 408	3
MATH 316 (or PHYS 312)	3
GEOG 320, 321, 322	9
Arts Electives	6
Total	33

Fourth Year

Course	Credits
OCGY 414	3
OCGY 449 or GEOG 449 ¹	6
GEOG 420, 421, 426	12
Electives ²	12
Total	33

¹ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without Physics 12 must take PHYS 100 prior to PHYS 101 or 121. Such students should take PHYS 102 in the second year. Qualified students are encouraged to take PHYS 121/122.

³ To be chosen in consultation with the departments.

⁴ Electing GEOG 449 requires that six credits of electives be Oceanography courses.

Combined Honours (0336) Oceanography and Physics (OCGY, PHYS)

First Year

Course	Credits
CHEM 121, 122 (110)	6
ENGL 100-level ¹	6
MATH 100, 101 (120, 121)	6
PHYS 121, 122 (101, 102) ²	6
Elective ³	6
Total	30

Second Year

Course	Credits
PHYS 200, 203	6
PHYS 206, 209	6
MATH 200, 221, 215, 317	12
Science Electives ⁴	6
Arts Electives	6
Total	36

Third Year

Course	Credits
PHYS 301, 308	6
PHYS 303, 304	6
PHYS 306	3
PHYS 309	6
MATH 316	3
OCGY 308, 309	6
OCGY 408	3
Total	33

Fourth Year

Course	Credits
PHYS 401, 402	6
PHYS 406	3
OCGY 414	3
MATH 309	3
OCGY 449 or PHYS 449 ¹	6
Arts Elective	6
Science Electives ²	6
Total	33

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² Students without Physics 12 must take PHYS 100 prior to PHYS 101 or 121. Such students should take PHYS 102 in the second year. Qualified students are encouraged to take PHYS 121/122.

³ GEOL 100, ERTH 100 or GEOG 120, BIOL 100-level, CPSC 124 and 126 (or 111 and 118), GEOG 101.

⁴ Recommended: more Computer Science, Mathematics, or GEOG 200.

⁵ If PHYS 449 is taken, an additional three credits of Oceanography must be included in the science electives.

⁶ Recommended from the following: MATH 301, MATH 345, GEOG 301, GEOG 302, GEOG 322, CPSC 302.

Pharmacology (PCTH)

The Department of Pharmacology and Therapeutics offers opportunities for study leading to doctoral, master's and bachelor's degrees (Honours and Major). For information on the Ph.D. and M.Sc. degree programs, see the Faculty of Graduate Studies section of the *Calendar*. For further information on other courses within the Department, consult the Faculty of Medicine section of the *Calendar*. All students who intend to take Honours in Pharmacology must consult the Head of the Department.

Requirements for the B.Sc. Degree

First Year

Course	Credits
BIOL 110 or 115 ¹	0-3
BIOL 120 ²	3
CHEM 110 (121, 122)	6
ENGL 100-level ³	6
MATH 100, 101 (120, 121)	6
PHYS ⁴	6
Electives	3-0
Total	30

Major (0311)**Second Year**

Course	Credits
BIOL 200, 201	6
CHEM 230 (203)	6
MICB 200	6
Electives ¹	12
Total	30

Third and Fourth Years

Course	Credits
BIOC 301	3
BIOC 302 (303)	3-6
CHEM 205 (201, 202) ²	6
PCTH 300	6
PHYL 301	6
PCTH 400	6
PCTH Electives ³	6
Electives ⁴	21-21
Total	60

Honours (0019)**Second Year**

Course	Credits
BIOL 200, 201	6
CHEM 205 (201, 202)	6
CHEM 213 (203)	6
MICB 200	6
Electives ¹	12
Total	36

Third and Fourth Years

Course	Credits
BIOC 301, 303	9
BIOL 300	3
PCTH 300	6
PHYL 301, 303	9
PCTH 400, 402	12
PCTH 404	3
PCTH 449	3-6

PHYL 422 or 423 or 424	3
PCTH Electives	6
Science Electives	12-9
Total	66

BIOL 110 and 115 are not required of students with a grade of 80% or greater in BIOL 12; the requirement can be replaced with three credits of free electives.

¹ The requirement of six credits of PHYS must include PHYS 101 and any other PHYS course that is available for credit in the Faculty of Science.

² ENGL 112 recommended. Qualified students are recommended to consider ENGL 120 and/or 121. Three credits of first-year ENGL may be deferred until second year.

³ Electives must include the following:

- Sufficient courses numbered 300 or higher in the Faculties of Arts or Science to satisfy the requirement for 48 credits (including specified courses) for the B.Sc. (Major) degree.
- At least 12 credits from the Faculty of Arts in addition to the six credits of first-year ENGL.
- For B.Sc. Major students, at least nine credits must be Science electives outside the field of the major. The field of the major for Pharmacology is defined as all courses in Biochemistry, Biology, Pharmacology, and Physiology and all courses offered for Science credit by departments in the Faculty of Medicine.

⁴ Students may choose to take this in second year.

⁵ Chosen from: BIOC 302, 403; BIOL 300, 351, 355; MICB 302, PCTH 404. Suggested electives as Note 6 above or: ANAT 405; BIOL 333, 351; CHEM 305, 315; PCTH 408; PSYC 300.

Physics (PHYS)

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 programs and courses, see the Faculty of Graduate Studies.

Students may select their electives so as to obtain a concentration in an area of their interest. See the *Physics Program Guide* for an outline of appropriate courses and other information. The *Guide* is available in the Departmental office. Students entering second-year Physics B.Sc. programs are encouraged but not required to obtain program approval before registering. Any second-year student who meets program requirements may simply register in either Honours or Major using the program descriptions listed in the *Calendar*. Continuing third and fourth year Physics students making satisfactory progress do not require program approval. Students wishing to transfer into Physics in third year must contact the Department to obtain program approval.

Students in the General Science Program are invited to consult a Departmental adviser concerning appropriate courses.

Co-operative Education Program Physics

Co-operative Education is a process of education which integrates academic study with related and supervised work experience in co-operating employer organizations.

An optional Co-operative Education Program is available for students in Physics. The Program is intended to help prepare interested and qualified students for research careers in industry with twenty months of work placement supervised by practising professionals. Faculty advisers also visit students at their place of work and provide advice on technical reports required of all students in the program.

To be eligible, students must be admissible into the second-year Physics B.Sc. program with second-class standing. Admission is by application to the Science Co-op Office in April prior to second year (transfer students may be considered later). Selection of students will be based on academic performance and general suitability to the

work environment as determined by resume and interview. The total enrolment will be subject to the availability of appropriate work placements and faculty advisers. The work placements are arranged by mutual agreement between students and employing organizations. Participating students register for PHYS 298, 299, 399, 498 or 499 as appropriate, and pay the Cooperative Education Program fee per course (see Index for Fees — Special Fees).

Graduation in the Co-operative Education Program requires a student to complete each of PHYS 298, 299, 399, 498 and 499, in addition to the normal academic requirements. Students will have each satisfactorily completed course noted on their academic record.

Detailed information on the program can be obtained from the Department of Physics or from the Office of Co-operative Education in Room 309, Hennings Building, The University of British Columbia, 6224 Agricultural Road, Vancouver, B.C. V6T 1Z1.

Requirements for B.Sc. Degree

Major (0524)

First Year

Course	Credits
PHYS 121, 122 (101, 102) ¹	6
MATH 100, 101 (120, 121)	6
CHEM 121, 122 (110)	6
ENGL 100-level ²	6
Elective	6
Total	30

Second Year

Course	Credits
PHYS 211, 213 ³ , 215, 216	12
MATH 200, 221, 215	9
Arts Elective	6
Elective ⁴	3
Total	30

(Admission requirement: 60% standing in first-year Physics course.)

Students should obtain better than the minimum passing mark in each of PHYS 211, 213, 215 and 216 to enrol in the Physics Major program.

Third Year⁵

Course	Credits
MATH 317	3
PHYS 200	3
PHYS 312	3
PHYS 311, 319	6
Electives ⁶	15
Total	30

Fourth Year⁵

Course	Credits
PHYS 412	3
PHYS 308	3
PHYS Elective ⁶	12
Arts Elective	6
Electives ⁷	6
Total	30

¹ Students without Physics 12 should consult departmental adviser as early as practical. Normally they must take PHYS 100 prior to PHYS 101 or 121. Such students may take PHYS 102 in the second year. Qualified students are encouraged to take PHYS 121/122.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ PHYS 213 can be postponed to the third year.

⁴ CPSC 122 is strongly recommended.

⁵ Early consultation with a Physics Departmental adviser is recommended before entering third and fourth year.

⁶ To be chosen from PHYS 305, 314, 315, 317, 318, 400, 404, 405, 406, 409, 411, 414, 420. Exceptional Physics Major students may be admitted in

their final year to one or more of PHYS 303, 304, 306 upon receiving approval from the appropriate course instructor(s).

⁷ Of the electives, at least nine credits must be in subjects other than the field of the Major. The excluded courses are all PHYS, CHEM and MATH courses. Of the remaining credits, six may be in any faculty, while the rest may be taken in any courses in Arts or Science including the field of the Major.

Honours (0344)

First Year

Course	Credits
PHYS 121, 122 (101, 102) ¹	6
MATH 120, 121 (100, 101)	6
CHEM 121, 122 (110)	6
ENGL 100-level ²	6
Arts Elective	6
Total	30

Second Year

Course	Credits
PHYS 200, 206 ⁴	6
PHYS 203 ⁵ , 209 ⁵	6
MATH 200, 317 ⁶	6
MATH 221, 215	6
Arts Elective	6
Science Elective ⁵	6
Total	36

Admission Requirements: A clear pass from first year with an overall standing of at least 68% in each first-year Physics, Chemistry and Mathematics course. An average standing of at least 68% must be obtained in each year to remain in the Honours Program (Single or Combined).

Third Year

Course	Credits
PHYS 301, 308	6
PHYS 303, 304	6
PHYS 306	3
PHYS 309	6
MATH 300, 301, 316	9
Elective	3
Total	33

Fourth Year

Course	Credits
PHYS 401, 402	6
PHYS 409	3
PHYS 449 ⁶	6
Additional Physics ⁷	6
MATH 400, 401 ⁸	6
Elective	6
Total	33

¹ PHYS 121/122 are recommended. Students without Physics 12 should contact a Departmental adviser as early as practical. Normally they must take PHYS 100 prior to 101 or 121. Such students may take PHYS 102 in the second year.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ PHYS 211/215 and 215 with 80% or better may be substituted for PHYS 203 and 209 respectively.

⁴ PHYS 206, MATH 317 or three credits of electives may be postponed to third year.

⁵ At least one course in Computer Science is recommended.

⁶ Coop students may substitute other physics courses with permission of the Head of the Department.

⁷ Chosen from the following PHYS courses: 305, 400, 403, 406, 408, 473, 474, or 477.

⁸ With the permission of the Head of the Physics Department another course may replace MATH 400 or 401.

**Combined Honours (0009)
Physics and Astronomy
(PHYS, ASTR)**

First Year

As for Honours Physics	30
Total	30

Second Year

As for Honours Physics ¹	36
Total	36

Third Year

Course	Credits
PHYS 301, 304	6
PHYS 303, 308	6
PHYS 309	6
ASTR 302, 303	6
MATH 300, 301, 316	9
Total	33

Fourth Year

Course	Credits
PHYS 306 ²	3
PHYS 401, 402	6
ASTR 401, 402, 421, 431	12
ASTR/PHYS 419	6
Electives ³	6
Total	33

¹ Recommended Science Elective: ASTR 200.

² PHYS 306 may be taken in third year.

³ MATH 400 and 401 are strongly recommended.

**Combined Honours (0517)
Physics and Chemistry
(PHYS, CHEM)**

First Year

As for Honours Physics	30
Total	30

Second Year

Course	Credits
PHYS 200, 206	6
PHYS 203, 209	6
CHEM 201, 202	6
CHEM 203	6
MATH 200, 221, 215	9
Elective ¹	3
Total	36

Third Year

Course	Credits
PHYS 301	3
PHYS 303, 304	6
PHYS 309	6
CHEM 304	6
CHEM 310	6
CHEM 312	4
MATH 316	3
Total	34

Fourth Year

Course	Credits
PHYS 308	3
PHYS 402	3
Additional Physics as per consultation ²	6
CHEM 311	4
Additional Chemistry as per consultation ²	8
Arts Elective	6
Elective	2
Total	32

¹ See footnotes 5, 4, 5 for Honours Physics. MATH 317 is recommended.

² These additional credits should include either CHEM 419 (6) and PHYS 401 (3) or PHYS 449 (6) and CHEM 401 or 407 (3).

**Combined Honours
Physics and Computer Science**

See Computer Science Programs.

**Combined Honours (0014)
Physics and Mathematics
(PHYS, MATH)**

First Year

As for Honours Physics	30
Total	30

Second Year

Course	Credits
PHYS 200, 205 ²	6
PHYS 206, 209 ²	6
MATH 223, 226, 227, 215	12
Science Elective	6
Arts Elective	6
Total	36

Third Year

Course	Credits
PHYS 301, 304	6
PHYS 303, 306	6
PHYS 309 ³	6
MATH 300, 301	6
MATH 316	3
MATH 320, 321	6
Electives	3
Total	36

Fourth Year

Course	Credits
PHYS 308, 402	6
PHYS 449	6
Twelve credits from MATH 322, 323, 400-403, 416-429, 440, 449	12
Electives	6
Total	30

¹ See Mathematics for language requirement.

² See footnotes 3, 4, 5 for Honours Physics.

³ With permission of the Head of the Physics Department PHYS 309 (6) may be replaced by PHYS 319 (3) in the third year and PHYS 409 (3) in the fourth year.

**Combined Honours
Physics and Oceanography**

See Oceanography Programs.

**Courses Primarily for First-Year
Science Students**

Physics 11 (B.C. Secondary School) or equivalent is a prerequisite for all students entering the Faculty of Science. Students lacking Physics 11, but wishing to enter, should submit a special appeal to the Registrar's Office with their application to take PHYS 100.

Science students with Physics 11, but not Physics 12 are required to take six credits of Physics. Normally this requirement is met by taking PHYS 100 and 101 (or 121). Science students with Physics 12 are required to take three credits of Physics and this requirement is normally met by taking PHYS 101 or 121. Physics 101, 102 or 121,122 constitute a standard first year Physics program.

PHYS 100 is intended primarily for students who have completed only B.C. Secondary School Physics 11 or its equivalent. Credit will not be given to students with credit for Physics 12.

PHYS 101 normally requires Physics 12 or PHYS 100. Students with only Physics 11 but with a good mathematics background may after consultation with an adviser skip PHYS 100 and enroll in PHYS 101. They will still need to take six credits of Physics. Credit will be given for only one of PHYS 101, 121.

PHYS 121 is open to students who have obtained an A in one of Physics 12 or Mathematics 12 and a B or better in the other course, and who are particularly interested in physical science and/or its application to other fields or disciplines.

Students planning to go into Physics or Applied Science (and some other programs) are required to take PHYS 102, or PHYS 122, in addition to PHYS 101 and 121. PHYS 102 has PHYS 101 or 121 as prerequisite, while PHYS 122 requires PHYS 121 or PHYS 101 with an A standing. Admission into the Second-Year Honours Physics program generally requires

PHYS 121,122 and a clear First-Year pass with either overall Second Class standing in 30 credits or at least 68% in each of PHYS 121,122 and MATH 100, 101 (120, 121). Students who were not eligible for PHYS 121, 122 may substitute PHYS 101, 102 provided all other minimum requirements were also met. Credit will only be given for one of PHYS 102, 122.

Non-science students without Physics 11 may take PHYS 100 in their second or later year.

For students not specializing in Physics

PHYS 141 (3) and 142 (3) are for students not in the Faculty of Science.

PHYS 230 (3) is primarily for students in Faculty of Science who are not specializing in Physics.

PHYS 340 (6), 341 (3) and 440 (6) are primarily for students not in the Faculty of Science. PHYS 317 (3) and PHYS 318 (3) are recommended for General Science, Pre-Architecture and Education students.

Physiology (PHYL)

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 programs, see the Faculty of Graduate Studies. For further information on other courses within the Department, consult the Faculty of Medicine section of the *Calendar*.

Completion of first year program requirements and the second year organic chemistry requirement is a prerequisite to all courses in Physiology.

BIOC 300 (or BIOL 201/BIOC 302) and PHYL 301 and 302, or 303, or consent of the Department are prerequisite to all courses in Physiology numbered 401 or higher.

Enrolment in PHYL 303 is available only to Physiology and Pharmacology Honours students. Students wishing to enter the third year of the Physiology program will be guaranteed admission only if they have completed all the prerequisites and have either a First-Class cumulative average or a cumulative average of at least 72% and a First-Class average in the required Biology and Chemistry courses in second year. Other students may register provisionally. The minimum requirement is a 72% cumulative average for the 66 credits attempted in first and second years.

Requirements for the B.Sc. Degree**Honours (0266)**

Course	Credits
BIOL 110, (115) ¹	0-3
BIOL 120	3
PHYS ²	6
CHEM 110(121,122)	6
ENGL 100-level ³	6
MATH 100,110 (120,121)	6
Electives	3-6
Total	30

Second Year¹

Course	Credits
BIOL 200, 201	6
CHEM 205 or 201 and 202	6
CHEM 213 (or 205 or 230)	6
MATH 200	3
MICB 200	6
Arts Elective	6
Science Elective	3
Total	36

Third Year

Course	Credits
BIOC 301, 302	6
BIOL 300	3
PHYL 301	6
PHYL 303	3
Arts Elective	6
Electives	9
Total	33

Fourth Year

Course	Credits
PHYL 422, 423, 424, 426	12
PHYL 430 ²	6
PHYL 449 ³	6
ANAT 405	3
Elective	6
Total	33

¹ Not required of students with a grade of 80% or greater in BIOL 12; may be replaced with three credits of free electives. BIOL 120 is required.

² PHYS 101 and any other PHYS course that is for credit in the Faculty of Science. Students with Physics 12 may defer three credits to second year, but all students are encouraged to complete this requirement in first year.

³ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121.

⁴ Students must attempt at least 35 credits in the winter session.

⁵ Students will normally be required to take PHYL 430 and 449 in the same winter session.

Suggested elective for the Honours Program in Physiology: BIOL 501, 531, 434; CPSC 111, or 124 and 126; PSYC 260, 360; PCTH 305.

Psychology (PSYC)

The Department offers opportunity for study leading to bachelor's, master's, and doctoral degrees. For information on the B.A. degree courses see the Faculty of Arts. For information on the M.A. and Ph.D. degree courses, see the Faculty of Graduate Studies.

The B.Sc. program is specifically intended for those students whose interest in Psychology is in the biological basis of behaviour. The student with a major interest in the social, personality, developmental, clinical or general experimental areas of psychology should register for the B.A. degree.

Requirements for the B.Sc. Degree Students entering the Major or Honours program should obtain details of the structure of Psychology undergraduate courses from the Department office.

Students registered in Psychology programs must satisfy the Faculty of Science requirement of 18 credits of Arts by electing Faculty of Arts courses other than Psychology. Science electives may not be Psychology courses. In addition to PSYC 348 and 448, all Psychology courses numbered 60 or higher in the last two digits have Science credit.

Requirements for the B.Sc. Degree**Major (0495)**

Course	Credits
BIOL 110 or 115, 120 ¹	6
CHEM 110 or 121, 122	6
ENGL 100-level ²	6
MATH 100, 101 (120, 121)	6
PHYS 100, 101 or 301, 102	6
Total	30

Second Year

Course	Credits
PSYC 260	6
Six credits from BIOL 200, 201, 204, 205	6

CHEM 230	6
Arts Elective ⁴	6
Elective	6
Total	30

Third Year

Course	Credits
PSYC 360	6
PSYC 366	6
Arts Elective ⁴	6
Electives ^{5,6}	12
Total	30

Fourth Year

Course	Credits
Twelve credits from PSYC 460, 463, 465, 466, 467	12
Psychology Elective ⁸	6
Electives ^{5,6}	12
Total	30

¹ Psychology 100 is recommended if student has prior credit for any of the required courses. Students of exceptional ability may, with permission of the Dean, take up to 36 credits, including PSYC 100.

² Students with 80% or above in Biology 12 should take BIOL 120 and three additional credits of electives.

³ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

⁴ General electives may be Psychology courses; Arts electives and Science electives may not.

⁵ At least 24 credits of electives (including Arts electives and Psychology elective) must be numbered 300 or above. At least six of these must be in the Faculty of Science. Nine credits of electives must be taken outside of the field of the major. Field of the major is defined as any course in Psychology, Biology, Physiology, Biochemistry, or Pharmacology. Six credits of electives may be taken in any Faculty.

⁶ Psychology courses must be numbered 200 or above.

Honours (0139)

First Year¹

Course	Credits
BIOL 110 or 115, 120 ²	6
CHEM 110 or 121, 122	6
ENGL 100-level ³	6
MATH 100,101 (120, 121)	6
PHYS 100, 101 or 101, 102	6
Total	30

Second Year

Course	Credits
PSYC 260	6
Six credits from BIOL 200, 201, 201, 205	6
CHEM 230	6
Arts Elective ⁴	6
Elective	6
Total	30

Third Year

Course	Credits
PSYC 312	6
PSYC 360	6
PSYC 366	6
Arts Elective ⁴	6
Electives ^{5,6}	12
Total	36

Fourth Year

Course	Credits
Twelve credits from PSYC 460, 463, 465, 466, 467	12
PSYC 449	6
Psychology Elective ⁸	6
Electives ^{5,6}	12
Total	36

¹ Psychology 100 is recommended if student has prior credit for any of the required courses. Students of exceptional ability may, with permission of the Dean, take up to 36 credits, including PSYC 100.

² Students with 80% or above in Biology 12 should take BIOL 120 and three additional credits of electives.

³ ENGL 112 recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

⁴ General electives may be Psychology courses; Arts electives and Science electives may not.

⁵ At least 24 credits of electives (including Arts electives and Psychology elective) must be numbered 300 or above. At least six of these must be in the Faculty of Science. Nine credits of electives must be taken outside of the field of the major. Field of the major is defined as any course in Psychology, Biology, Physiology, Biochemistry, or Pharmacology. Six credits of electives may be taken in any Faculty.

⁶ Psychology courses must be numbered 200 or above.

Statistics (STAT)

The Department of Statistics offers programs of study leading to bachelor's, master's and doctoral degrees. For information on the M.Sc. and Ph.D. degree programs, see the Faculty of Graduate Studies section of the *Calendar*. Before registering for each of the second, third and fourth years, every student who intends to commence or continue any of the programs listed below should consult an adviser in the Statistics Department.

The Statistical Consulting and Research Laboratory, operated by the Department of Statistics, is intended to provide statistical advice to the University's faculty and, with the approval of their supervisors, to graduate students working on research problems. In providing this service to the University, the Department hopes to foster interdisciplinary collaboration in research projects involving statistics. The Statistical Consulting and Research Laboratory also acts as a statistical research support unit and provides students in statistics with opportunities for actively learning to apply statistics.

Co-operative Education Program: Statistics

This optional program integrates academic study with related and supervised work experience. Enrolment is limited. Detailed information is available from the Department of Statistics or the Office of Co-operative Education (Hennings 309).

Requirements for the B.Sc. Degree

Major (0562)

First Year	
Course	Credits
MATH 100, 101 (120, 121)	6
CHEM 116 or 121	3-6
PHYS 101 or 121 ¹	3
ENGL 100-level ²	6
CPSC 122, 128 (124, 126) ³	6
Electives	3-6
Total	30

Second Year

Course	Credits
STAT 200	3
STAT/MATH 302	3
MATH 200, 220, 221	9
Arts Elective	6
Electives ⁵	9
Total	30

Third and Fourth Years

In the third year: STAT 305, 306 and MATH 307	9
In the fourth year: STAT 404	3
MATH 303	3
Statistics courses numbered 300 or above	9
Statistics courses numbered 400 or above	6
Mathematics courses numbered 300 or above	3
Computer Science courses numbered 300 or above ⁴	6
Arts Elective	6
Electives ⁵	15
Total	60

¹ Students without Physics 12 must take PHYS 100 prior to PHYS 101 (121).

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ May be deferred until second year. CPSC 118 (3) and a three-credit elective can be substituted by those eligible for CPSC 118.

⁴ Selections from CPSC 302, 303, 304, 310, 320, 322, 402, 405, 404, 405, 406, and 414 are recommended. Note that many of these courses have 200-level Computer Science courses as prerequisites.

⁵ Electives must include the following:
 i. Six credits may be in any Faculty other than Science.
 ii. At least six credits must be for courses numbered 300 or higher.
 iii. At least nine credits must be in Science electives outside the field of the Major or in Arts.
 iv. The field of the Major for Statistics is defined as all courses in the Departments of Statistics, Mathematics, and Computer Science.

Honours Programs (0051)

Students planning to take an Honours degree in Statistics or a Combined Honours degree in Mathematics and Statistics, please note the following:

- 1) To be admitted to either of these programs in second year, a student must obtain at least 65% in MATH 121 or 80% in MATH 101 and an 80% average in MATH 100/101.
- 2) Students must obtain formal program approval from a Departmental adviser (from both departments for the Combined Honours program) before registration will be considered complete for Second, Third and Fourth Years. Ideally this would be done before registration, but program approval can also be obtained in the first two weeks of the academic year.
- 3) To continue in these programs, a student must obtain an overall second-class standing in each academic year.

First Year

Course	Credits
MATH 120, 121 (100, 101)	6
CHEM 121 or 110	3-6
PHYS 121 or 101 ¹	3
ENGL 100-level ²	6
CPSC 122, 128 (124, 126) ³	6
Electives	3-6
Total	30

Second Year

Course	Credits
STAT 200	3
STAT/MATH 302	3
MATH 220 ⁴ , 223 (or 221)	6
MATH 226 ⁴ , 227 (200, 317)	6
Arts Elective	6
Electives	9
Total	33

Third and Fourth Years

In the third year: STAT 305, 306 and MATH 303 ⁴ , 307, 320, 321	18
In the fourth year: STAT 404, 405, 406 and six credits chosen from MATH 418, 419, 420, 421 and Statistics courses numbered 400 or above	15
Statistics courses numbered 300 or above	3
Statistics courses numbered 400 or above	6
Additional courses chosen from Computer Science and Mathematics courses numbered 300 or above	6
Arts Elective	6
Electives	15
Total	69

¹ ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

² May be deferred until second year. CPSC 118 (3) and a three-credit elective can be substituted by those eligible for CPSC 118.

³ Students obtaining 68% or above in MATH 226 are not required to take MATH 220.

⁴ May be replaced by MATH 419 in fourth year.

⁵ Students without Physics 12 must take PHYS 100 prior to PHYS 101 (121).

Combined Honours (0550) Mathematics and Statistics¹ (MATH, STAT)

First Year

Course	Credits
MATH 120, 121 (100, 101)	6
CHEM 121 or 110	3-6
PHYS 100-level	6
ENGL 100-level ²	6
CPSC 124, 126 or CPSC 122, 128 ³	6
Electives	0-3
Total	30

Second Year

Course	Credits
STAT 200	3
STAT/MATH 302	3
MATH 220 ⁴ , 223 (or 221)	6
MATH 226, 227 (200, 317)	6
MATH 215 ⁵	3
Arts Elective	6
Electives	6
Total	33

Third Year

Course	Credits
STAT 305, 306	6
MATH 303 ⁶	3
MATH 320, 321 ⁷	6
Nine credits from MATH 300, 301, 316, 322, 323, 331 ⁸	9
Arts elective	6
Elective ⁹	3
Total	33

Fourth Year

Course	Credits
STAT 404, 406	9
Statistics courses numbered 400 and above	3
Twelve credits from: MATH 400-405, 416-429, 440, 449 ¹⁰	12
Electives ¹¹	9
Total	33

¹ May be deferred until second year. CPSC 118 (3) and a three-credit elective can be substituted by those eligible for CPSC 118.

² ENGL 112 is recommended. Qualified students are encouraged to consider ENGL 120 and/or 121. Three credits of first-year English may be deferred until second year.

³ Students obtaining 68% or above in MATH 226 are not required to take MATH 220.

⁴ May be deferred until the third year.

⁵ May be replaced by MATH 419 in fourth year.

⁶ Electives in the third and fourth year must include at least six credits selected from Statistics courses numbered 300 or above.

⁷ An overall 68% average is required in these 27 credits to obtain this combined Honours degree.

Probability and Statistics

Listed below are the introductory courses in probability and statistics. Students may obtain credit for only one course in any section and may obtain at most a total of six credits from all of these introductory courses. Therefore, a student obtaining credit for a six-credit course in section three could not obtain additional credit for courses in the first two sections.

Probability

COMM 290	3
COMM 311	3
MATH 205	3
MATH 302	3
STAT 205	3
STAT 241	3
STAT 251	3
STAT 302	3

Statistics

ANTH 218	3
BIOL 300	3
COMM 291	4
COMM 312	3
EPSE 482	3

EPSE 483	3
GEOG 374	3
HKIN 371	3
PLNT 321	3
POLI 380	3
STAT 200	3
STAT 203	3

Probability and Statistics

EGON 325	3
FRST 231	3
PSYC 318	3
PSYC 366	6
STAT 241	3
STAT 251	3

Students may obtain credit for at most one of the following courses: FRST 430, PLNT 322, BIOL 301.

The following list of courses in Probability and Statistics, while not complete in the sense that there are many other courses which deal with the uses of statistics in particular fields of study, contains most of the courses in which principles and techniques of Probability and Statistics are discussed.

ANTH - Anthropology

218	Statistical Methods I. (Same as STAT 203)
418	Social Statistics.
527	Advanced Archeological Methods.
528	Advanced Quantitative Methods.

BIOL - Biology

300	Biometrics.
301	Biomathematics.
509	Advanced Biometrics.

COMM - Commerce

290	Introduction to Decision Analysis.
291	Applications of Statistics in Business.
311	Decision Analysis, I.
312	Decision Analysis, II.
411	Intermediate Business Statistics.
580	Business Statistics.
581	Statistical Methodology, I.
582	Statistical Methodology, II.
583	Forecasting and The Time Series Analysis in Business Environments.
585	Applied Stochastic Processes, I.
586	Dynamic Programming and Stochastic Control.
587	Applied Stochastic Processes, II.
682	Advanced Topics in Stochastic Models.
684	Topics in Advanced Business Statistics.

ECON - Economics

325	Introduction to Empirical Economics.
326	Methods of Empirical Research in Economics.
425	Introduction to Econometrics.
426	Econometric Analysis.
526	Probability and Statistics for Use in Economics.
527	Econometric Methods of Economic Research.
529	Topics in Theoretical Econometrics.
530	Topics in Applied Econometrics.

EPSE - Educational Psychology and Special Education

482	Introduction to Statistics for Research in Education.
483	Statistics in Education.
484	Nonparametric and Related Statistics.
592	Design and Analysis in Educational Research I.
596	Design and Analysis in Educational Research II.
597	Factor Analysis and its Application to Behavioural Sciences.
682	Multivariate Analysis in Behavioural Research.

FRST - Forestry

231	Introductory Biometrics for Forestry.
430	Advanced Biometrics.
431	Sampling Methods.
530	Multiple Regression Methods.
531	Multivariate Statistical Methods.
533	Problems in Statistical Methods.
539	Problems in Forest Sampling.

GEOG - Geography

374	Statistics in Geography I.
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HCEP - Health Care and Epidemiology

400	Statistics for Health Research.
527	Analytic Methods in Epidemiological Research.

HKIN - Human Kinetics

371	Introduction to Statistics and Research Methodology.
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MATH - Mathematics

205	Elementary Probability I. (Same as STAT 205)
302	Introduction to Probability. (Same as STAT 302)
303	Introduction to Stochastic Processes.
418	Probability.
419	Stochastic Processes.
544	Probability I.
545	Probability II.
608	Topics in Probability.

PCTH - Pharmacology and Therapeutics

104	Drug Assay and Pharmacometrics.
512	Experimental Design and Bioassay.

PHYS - Physics

509	Theory of Measurements.
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PLNT - Plant Science

321	Biometrics.
322	Design of Experiments.

POLI - Political Science

380	Quantitative Methods in Political Science.
381	Topics in Quantitative Analysis.

PSYC - Psychology

317	Research Methods and Design.
318	Analysis of Behavioural Data.
366	Methods in Research.
464	Advanced Research Methods in the Behavioural Sciences.
515	Advanced Statistics I.

RHSC - Rehabilitation Sciences

102	Introduction to Scientific Inquiry.
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SOCI - Sociology

118	Social Statistics. (Same as ANTH 118)
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STAT - Statistics

(See courses offered by the Department of Statistics)

WOOD - Wood Science and Industry (Listed under Forestry)

335	Quality Improvement.
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Major Mathematical Sciences

(Offered with Departments of Computer Science and Mathematics)

See Mathematics programs.

Zoology (ZOO)

The Department offers programs of study jointly with the Department of Botany leading to a bachelor's degree in Biology. There is no undergraduate degree in Zoology.

The Department of Zoology offers programs leading to the master's and doctoral degree. For details students are directed to the Faculty of Graduate Studies section of the *Calendar*.

Facilities are available for advanced study and research in the following areas: Aquaculture, Biological Oceanography, Comparative Physiology, Developmental and Cell Biology, Ecology, Entomology, Ethology, Fish Biology and Fisheries, Genetics, Ichthyology and Limnology, Marine Biology, Parasitology, Vertebrate and Invertebrate Zoology and Zoogeography. Attention is directed to the following applied fields.

Aquacultural Science

An undergraduate degree program leading to a B.Sc. Honours in Aquacultural Science is offered through the cooperation of several faculties. Students are directed to this listing in the *Calendar*.

Ecology

The Ecology Group in the Department of Zoology offers research opportunities at the local, national and interna-

tional level in Aquatic, Evolutionary, Mathematical, Population and Resource Ecology.

Entomology

Courses of study are offered through the Department of Zoology and the Faculties of Forestry and Agricultural Sciences. Zoology offers introductory and advanced courses in entomology and maintains a museum collection and specialized library. Forestry has courses in insect ecology and in the special problems of forest entomology and forest protection. In Agricultural Sciences, the Department of Plant Science offers courses in economic entomology, biometeorology, insect physiology, pesticides, biological control, and plant-disease vectors.

At the graduate level, there is research guidance in problems relating to the classification, structure, function and bionomics of insects, as well as in special areas, such as biological control, biochemical genetics, and plant-insect relationships. Co-operative research on the ultrastructure, biology, or population dynamics of plant-disease vectors can be arranged through the Entomology Section of the Research Branch of Agriculture Canada, which maintains a large laboratory on campus.

Fish Biology and Fisheries

The Fish Biology and Fisheries Group maintains a strong tradition in fish-oriented research at the University of British Columbia. Studies range from physiology, ethology, biomechanics, systematics and evolution, through marine and freshwater ecology, to fisheries oceanography and management (population modelling, and fisheries economics).

In addition to facilities on campus, Federal and Provincial agencies encourage research in cooperation with government scientists, many of whom serve on students' Research Advisory Committees. 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.Sc.(Agr.) 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.

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Department of Statistics

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B. McCABE, Associate Professor, Commerce.

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S. HINGH, Assistant Professor, Forestry, Fisheries Centre, Westwater Research.
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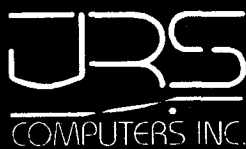
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Bachelor of Social Work B.S.W.

Educational Objectives

- 1) To provide students with the knowledge and skills necessary to begin professional practice in social work.
- 2) To prepare selected students for entry into advanced professional studies at the graduate level.

Program Structure

The B.S.W. program comprises of 60 credits of course work for students entering with a Bachelor's degree, and 66 credits for those entering the program after completing two years in the Faculty of Arts. The program integrates academic work with supervised social work practice in a social agency. Academic work includes study of social work practice methods; social policies; human behaviour in individuals, families, groups and communities; research methods in social work.

Admission

- 1) Admission to the B.S.W. program is open to:
 - a) Persons with a minimum of 60 credits of courses in the Bachelor of Arts program.
 - b) Persons holding a B.A. or equivalent degree.
- 2) An overall average of at least 68% on the last 60 credits preceding admission.
- 3) Pre-admission studies must include:
 - a) six credits of first-year English;
 - b) six credits of course work dealing with the dynamics of human behaviour, normally selected from the subject area of Psychology;
 - c) eighteen credits of course work selected from the subject areas of Anthropology, Canadian History, Economics, Geography, Political Science, Psychology, Sociology, and Women's Studies. Course work dealing with the Canadian political system and the history of Canada are highly recommended.
 - d) at least three credits in Statistics.
- 4) Applicants are required to satisfy the School of their personal potential and of their reasons for wanting to pursue a career in social work by submitting a professional statement. Letters of reference and an account of all relevant volunteer and/or paid work experience are also required. Assessment of professional suitability is determined by members of the School's faculty. The quality of the applicant's writing skills will be considered in the overall assessment.
- 5) Admission is based on the applicant's academic standing and suitability for a career in social work. Special consideration is given to qualified applicants of First Nations ancestry, members of a visible minority, or persons with disabilities.
- 6) Interviews are not normally required but may be requested by the School's Admissions Committee.
- 7) The Program has a limited enrollment, and admission is competitive. Fulfillment of the minimum requirements for admission is not a guarantee of acceptance.
- 8) Persons considering application to the Program must request the B.S.W. Admissions Package by writing to the Admissions Office, UBC School of Social Work, 2080 West Mall, Vancouver, B.C., V6T 1Z2. The package is available from December to February and contains required application forms with instructions and detailed program information.

Deadline for application to the Program is February 28.

The School of Social Work

A School within the Faculty of Arts.

The School of Social Work offers two degree programs: an undergraduate program leading to the B.S.W., the first professional degree in Social Work, and a graduate program leading to the M.S.W. degree for persons with a B.S.W. or equivalent degree. The School also participates in a doctoral program of individual Interdisciplinary Studies which is offered by the Faculty of Graduate Studies.

The School is a member of the Canadian Association of Schools of Social Work (C.A.S.S.W.), the policy and standard-setting body for social work education at the university level in Canada. The School's degree programs are accredited by the C.A.S.S.W.

Advancement

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 School reserves the right to require a student to withdraw from the B.S.W. program if the student is considered unsuited to proceed with the study or practice of social work.

Pattern of Courses in the B.S.W. Program

Year 1

Course	Credits	
SOWK 300	6	Canadian Social Policy I
SOWK 305	6	Social Work Practice I
SOWK 315	6	Practicum I
SOWK 320	3	Introduction to Social Work Research
SOWK 335	3	Fundamentals of Social Analysis for Social Work
SOWK 356	3	Theoretical Foundations of Social Work I
SOWK 357	3	Theoretical Foundations of Social Work II
	6	Arts - Elective courses in the Faculty of Arts ¹

Total 30 or 36

Year 2

Course	Credits	
SOWK 400	3	Canadian Social Policy II
SOWK 405	6	Social Work Practice II
SOWK 415	6	Practicum II
SOWK 420	3	Social Work Research
SOWK 430	0-6	Special Studies in Social Work and/or elective courses offered in the Faculty of Arts, preferably in the Social Sciences and Humanities ²
SOWK 435	3	Behavioural and Social Issues in Social Work Practice
SOWK 440	3-9	Integrative Seminars in Social Work
Total	30	

¹ These elective courses are required for students who enter the program without a B.A. or equivalent degree. Such courses must be numbered 300 or above. They may be taken either during a Summer Session or during the Winter Sessions. Details on qualifying electives will be available to B.S.W. students at the appropriate time.

² Details on elective courses will be available to B.S.W. students at the appropriate time. Health Care Ethics (HCET) 400 also meets this requirement.

Master of Social Work — M.S.W.

For general information on the School of Social Work's one-year and part-time M.S.W. program, see the listing

under the Faculty of Graduate Studies. Specific information on the program, requirements and application procedures is available from the School's Admissions Office.

Interdisciplinary Doctoral Studies

More specific information on the program is available from the School. Applicants to the program must hold a Master's Degree (or its equivalent) from a recognized graduate program in Social Work or a closely related field, and have social work experience.

Social Work Students' Association

Through this organization, all social work students participate directly in the affairs of the School through membership on many policy committees. In addition, the Association maintains a roster of its own committees, conducts curriculum reviews, arranges for visiting speakers and social gatherings, and participates in social action projects. The Association has established liaison with the B.C. Association of Social Workers.

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SUSAN COLE MARSHALL, Coordinator of Admissions and Student Services.
HELENA SUMMERS, Coordinator of Field Instruction.
BEVERLEY SCOTT, Librarian.

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FRANK TESTER, B.Sc. (W. Ont.), M.E.Des., M.S.W. (Calif.), D.Phil. (Waikato).

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127 Society for Housing
 Arthritis Society
 Association of Neighbourhood Houses
 B.C. Association for Community Care
 B.C. Association for Community Living
 B.C. Breast Association
 B.C. Cancer Agency
 B.C. Head Injury Association
 B.C. Parents in Crisis Society
 B.C. Rehab Residents Association
 B.C. Rehabilitation Society
 Britannia Community Services Centre
 Burnaby General Hospital
 Cedar Cottage Neighbourhood House
 Chesterfield House Society
 Children's Corner
 Chimo Richmond Crisis Centre
 Chimo Women's Programs
 CISO
 Deaf Children's Society of B.C.
 Delta Mental Health
 Delta Youth Services
 District of North Vancouver
 Downtown Eastside Women's Centre
 Downtown Eastside Youth Society
 East Side Family Place Society
 Eating Disorder Resources Centre
 End Legislated Poverty
 Eurcka Fine Arts Centre for Persons with Special Needs
 Family Advancement Program
 Family Court Services
 Family P.R.E.P. Program
 Family Services of Greater Vancouver
 Family Violence Intervention Project
 First Nations House of Learning
 Forensic Psychiatric Services
 Fraserville Community Services
 George Derby Centre
 Gordon Neighbourhood House
 Greater Vancouver Mental Health Services
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 Immigrant Services Society
 Inter-Ministerial Project
 Kids Safe Project
 KIWASSA Neighbourhood House
 Lions Gate Hospital
 Maple Ridge Alcohol and Drug Centre
 The Maples Adolescent Treatment Centre
 Ministry of Social Services
 Mount Pleasant Neighbourhood House
 Multicultural Family Centre
 Musqueam Nation
 Native Courtworkers and Counsellors' Association
 New Vista Society
 Nisha Family and Children's Services Society
 North Burnaby Alcohol and Drug Centre
 North Shore Community Mental Health
 North Shore Family Services
 North Shore Neighbourhood House
 Odyssey II
 OXFAM
 Pacific Coast Family Therapy Training Association
 Pacific Immigrant Resources Society
 Pacific Spirit Family and Community Services
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 Queen Alexandra Elementary School
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 Royal Columbian Hospital
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 Society of Special Needs Adoptive Parents
 South Vancouver Neighbourhood House
 Squamish Nation "A'as Men Men" Family and Children's Services
 St. Paul's Hospital
 St. Vincent's Health Care Society
 Sunny Hill Health Centre
 Surrey Memorial Hospital
 Surrey North Mental Health Centre

UBC Women's Resource Centre
 United Chinese Community Enrichment Services Society
 Vancouver and Lower Mainland Multicultural Family Support Services Agency
 Vancouver Health Department
 Vancouver Hospital and Health Sciences Centre
 Vancouver School Board
 Vancouver-Richmond Incest and Sexual Abuse Centre
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 Y.M.C.A. International Unit
 Y.W.C.A. Crabtree Corner
 Y.W.C.A. Munroe House
 Yaletown Family Therapy
 Youth Court Services



Course Numbering

In most faculties the courses numbered 100 to 199 are primarily for First Year students, those numbered 200 to 299 are primarily for Second Year students; similarly 300 to 399 for Third Year students and 400 to 499 for Fourth Year students. Courses numbered 500 and above are only available to undergraduates by permission of the departments concerned. Where Faculties have a different style of classification of courses the level of study is indicated in the description of their study programs.

Courses in the Faculty of Arts numbered 300 and above are open to First-year students only if listed on List A and to Second-Year students only if listed on Lists A or B (see Index, Faculty of Arts section).

Credit

In the course descriptions the "credit value" of a course, where given, is shown in parentheses following the course number. In general two "credits" represent one hour of instruction or 2 to 3 hours of laboratory work per week throughout both terms of a winter session (September to May). A credit is approximately one semester hour.

Courses with Variable Credits

Some courses are listed with a choice of credit value; the form: (2-6) implies that the course may be given for any number of credits from two to six inclusive; the form: (2/6) implies that the course will be given either for two credits or six credits.

Where the parentheses are followed immediately by "c" the credit value of the course will be determined by the student in consultation with the department offering the course. Where the parentheses are followed immediately by "d" the credit value of the course in any particular session will be determined by the department offering the course.

In all cases, the maximum credit value is that which may be obtained by a student during the complete program of study (i.e., it is not the maximum for a given year).

Prerequisites

If specific studies are required as background to a certain course they are described under "prerequisites" in the course description. In some instances prerequisites may be waived at the discretion of the instructor. General prerequisites that apply to all courses in a list are frequently given just before the list. In a dispute over the adequacy of prerequisites the course instructor will make the decision. In all cases where prerequisites are indicated the implication is "or the equivalent" and "or the consent of the instructor".

Where prerequisites are not indicated, the permission of the department is required.

Hours

The number of hours assigned each week to lectures (first digit) and to laboratory, discussion or tutorial seminars (second digit) are shown in brackets at the end of a course description. Where a third digit appears it refers to periods where assigned problems are done. An asterisk (*) indicates alternate weeks. The first set of digits refers to the first term (September to December) and the second set to the second term (January to May); when only one set is given it means either term. Graduate courses and courses in some faculties are not so designated.

Courses Offered

Not all course listed are offered each year. Most courses offered in a winter session, as well as places and times of class meeting and names of instructors, appear in the *Registration Guide* available to all students qualified to register. For those not so listed, contact the department concerned.

Courses of Instruction

Descriptions of all regular courses offered in the University may be found in the following section. Some common notations found on course descriptions are illustrated below. Please refer to headings on this page for details.

Course Number **Credits (3 or 6)** **Credit value determined by the Department**

319 (3/6) d *Introduction to Electroacoustic Music –*
 Study of acoustics, audio technology and electroacoustic composition. Prerequisites: MUSC 201 and permission of the instructor. [3-0-0] or [3-0-0; 3-0-0]

Hours: **First digit** lectures
 Second digit laboratory, discussion or tutorial
 Third digit assigned problems
 * alternate weeks
 ; separates terms

Course Abbreviations Listed Alphabetically

Abbreviation	
AAHE	Administrative, Adult and Higher Education
ADED	Adult Education
AGEC	Agricultural Economics
AGSC	Agricultural Sciences
ANAE	Anaesthesiology
ANAT	Anatomy
ANSC	Animal Science
ANTH	Anthropology
APSC	Applied Science
ARBC	Arabic
ARCH	Architecture
ARST	Archival Studies
ARTE	Art Education
ARTS	Arts One
ASIA	Asian Studies
ASLA	Asian Languages
ASTR	Astronomy
ASTU	Arts Studies
ATSC	Atmospheric Science
AUDI	Audiology and Speech Sciences
BIOC	Biochemistry
BIOE	Bio-Resource Engineering
BIOL	Biology
BOTA	Botany
BUED	Business Education
CHEM	Chemistry
CHIN	Chinese
CHMI	Chemical Engineering

CIVL	Civil Engineering	MECH	Mechanical Engineering
CLST	Classical Studies	MEDG	Medical Genetics
CDSC	Clinical Dental Sciences	MEDI	History of Medicine and Science
CNPS	Counselling Psychology	MEDM	Medicine
CDST	Canadian Studies	MICB	Microbiology
COML	Comparative Literature	MLED	Modern Languages Education
COMM	Commerce	MMAT	Metals and Materials Engineering
CONB	Conservation Biology	MMIB	Medical Microbiology
CONS	Natural Resources Conservation	MMPE	Mining and Mineral Process Engineering
CPSC	Computer Science	MRNE	Marine Science
CRWR	Creative Writing	MUED	Music Education
CSED	Computing Studies Education	MUSC	Music
CUST	Curriculum Studies	NRSC	Neuroscience
DENT	Dentistry	NURS	Nursing
EADM	Educational Administration	OBST	Obstetrics and Gynaecology
ECED	Early Childhood Education	OCCH	Occupational Hygiene
ECON	Economics	OCGY	Oceanography
EDCI	Education Curriculum and Instructional Studies	OMSS	Oral, Medial and Surgical Sciences
EPSE	Educational Psychology and Special Education	OPHT	Ophthalmology
EDST	Educational Studies	ORBI	Oral Biology
EDUC	Education	ORPA	Orthopaedics
ELEC	Electrical Engineering	PAED	Paediatrics
ENED	English Education	PATH	Pathology
ENGL	English	PCTH	Pharmacology and Therapeutics
ENVR	Environmental Studies	PHAR	Pharmaceutical Sciences
ERSC	Earth Science	PHIL	Philosophy
FILM	Film Studies	PETE	Physical Education
FINA	Fine Arts	PHYL	Physiology
FISH	Fisheries	PHYS	Physics
FMPR	Family Practice	PLAN	Planning
FMSC	Family Science	PLNT	Plant Science
FMST	Family Studies	POLI	Political Science
FOOD	Food Science	POLS	Polish
FOPR	Forest Operations	PORT	Portuguese
FPEN	Fire Protection Engineering	PSYC	Psychology
FREN	French	PSYT	Psychiatry
FRST	Forestry	PUNJ	Punjabi
GENE	Genetics	RADI	Radiology
GEOG	Geography	READ	Reading Education
GEOI	Geological Sciences	RELG	Religious Studies
GEPH	Geophysics	RGLT	Religion and Literature
GEPA	Geophysics and Astronomy	RIME	Rehabilitation Medicine
GERM	German	RISC	Rehabilitation Sciences
GREK	Greek	RMES	Resource Management and Environmental Studies
HCET	Health Care Ethics	RMST	Romance Studies
HCEP	Health Care and Epidemiology	RSOT	Occupational Therapy
HEBR	Hebrew	RSPT	Physical Therapy
HIED	Higher Education	RUSS	Russian
HIND	Hindi	SANS	Sanskrit
HIST	History	SCAN	Scandinavian
HKIN	Human Kinetics	SCED	Science Education
HMEC	Home Economics	SCIG	Science
HMED	Home Economics Education	SCIE	Science One
HUNU	Human Nutrition	SEAL	Southeast Asian Languages
INDC	Indic Languages	SLAV	Slavic Studies
INDE	Interdepartmental	SOAL	South Asian Languages
INDO	Indonesian	SOCI	Sociology
INDS	Interdisciplinary Studies	SOIL	Soil Science
ITAL	Italian	SOWK	Social Work
ITST	Italian Studies	SPAN	Spanish
JAPN	Japanese	SSED	Social Studies Education
KORN	Korean	STAT	Statistics
LARC	Landscape Architecture	SURG	Surgery
LANE	Language Education	THTR	Theatre
LATN	Latin	UKRN	Ukrainian
LAW	Law	URDU	Urdu
LIBE	Teacher Librarianship	URST	Urban Studies
LJBR	Library and Information Studies	VRIC	Vocational Rehabilitation Counselling
LING	Linguistics	WMST	Women's Studies
MAED	Mathematics Education	WOOD	Wood Science and Industry
MATH	Mathematics	ZOOL	Zoology
MDVL	Medieval Studies		

Administrative, Adult and Higher Education **AAHE**
SEE EDUCATIONAL STUDIES, FACULTY OF EDUCATION

Adult Education **ADED**
SEE EDUCATIONAL STUDIES, FACULTY OF EDUCATION

Agricultural Economics **AGEC**
FACULTY OF AGRICULTURAL SCIENCES

Note: All courses in Agricultural Economics except AGECE 401 and 403 require Economics 10.

- 201 (3) Introduction to Farm and Business Management – Concepts and principles. Farm organization and operation, capital and labour requirements, budgeting, opportunity cost, enterprise combination, appraisal, and revenue. [3-1; 0-0]
- 258 (3) Introduction to Agricultural Economics – Economic analysis for food production and marketing in Canada and around the world. [0-0; 3-0]
- 260 (3) Introduction to Analytical Methods in Agricultural – Linear and nonlinear optimizing methods useful in understanding concepts, analysis and policy. Prerequisite: MATH 100 or 140. [2-2; 0-0]
- 295 (3) Managerial Economics – Economic foundations of managerial decision-making. Organization of the firm, demand theory, cost and production, market structure, competitive strategy, welfare-economic foundations of business regulation. Prerequisites: ECON 100, MATH 140, and MATH 141 or their equivalents. Credit may be obtained for only one of ECON 201, ECON 206, AGECE 295, COMM 295. [3-0; 0-0]
- 302 (3) Farm Management II – Use of farm planning models. Adjustments to risk, capital budgeting. Prerequisite: AGECE 201. [0-0; 3-2]
- 306 (3) Agricultural Market Organization – Structure, conduct and performance in agricultural markets. Marketing margins, legislation, marketing boards and co-operatives. Historic attempts to improve market channels and achieve market power. [3-0; 0-0]
- 340 (3) Rural Development – The economic causes and consequences of slow growing rural regions. Legislation, welfare measures, disguised unemployment, education, taxation and population changes. Methods for initiating and stimulating growth. [3-0; 0-0]
- 361 (3) Linear Programming in Agriculture – Applications of linear programming. Introduction to the concepts, graphic solution, the simplex procedure, basic theorems, primal and dual solutions. Setting up problems, computing, interpreting the results. Prerequisite: MATH 100 or 140. [3-2; 0-0]
- 374 (3) Land Economics – Economic analysis applied to problems of land use. Rent theory, land evaluation, land conservation. Techniques for assessing economic efficiency of land use. Effects of institutions and public policies on land use. (Same as ECON 374.) [3-0; 0-0]
- 400* (3) Enterprise Evaluation – Observing, recording and evaluating economic performance and profitability of local agricultural firms. Laboratory only. *Additional Field Trip fees are charged for this course. See Index "Fees – Special Fees". [0-3; 0-3]
- 401 (3) 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. [2-2; 0-0 or 0-0; 2-2]
- 403 (6) The Organization of Rural Society – Characteristics of people, groups and organizations; dimensions of the rural community, nature and direction of community development. Prerequisite: SOCI 100 or consent of instructor. [3-0; 3-0]
- 407 (3) Agricultural Market Prices – Determinants of farm prices and income, policies designed to influence market prices and returns to farmers, price fluctuations and cycles, price analysis and forecasting, fitting supply and demand functions. Prerequisite: ECON 201 or AGECE 295 AND ECON 326 or COMM 291. [0-0; 3-0]
- 411 (3) Managerial Economics Under Uncertainty – Concepts of classical and Bayesian probability applied to economic problems in managerial economics. Useful distributions, opportunity loss, conditional and joint probability, decision rules, costs of uncertainty, value of information, bidding and games in oligopoly. Prerequisite: ECON 201 or AGECE 295. [0-0; 3-0]
- 415 (3) Animal Economics – Study of animal science and economic parameters: their use in design of primary production systems for growth, nutrition, reproduction, lactation and genetic improvement. Decision-making under various biological and economic constraints, options and opportunities. (Not offered every year.) [0-0; 3-0]
- 416 (3) Economics of Horticultural Crops – Economic importance of horticultural crops. Business management principles in horticultural production. Location, transportation, processing and market organizations. Problems in relation to policy and legislation. [3-0; 0-0]
- 420 (3) Agricultural Policy – Goals, policies and programs for agriculture in B.C. and Canada. Existing policies, alternative policies, institutions and their effects. Economic research for policy formulation. Prerequisite: ECON 201 or AGECE 295. [0-0; 3-0]
- 421 (3/6) d Topics in Agricultural Economics – A lecture course dealing with current topics of interest.
- 423 (2) Seminar – Application of economic analysis to contemporary problems in agricultural economics. [1-0; 1-0]
- 430 (2-6) c Directed Studies – On an approved problem.
- 498 (3) Undergraduate Essay – Preparation of a comprehensive and analytical review of an approved topic under the supervision of a faculty member. Prerequisite: Approval of the Head of Department. Consult before the end of classes in third year.
- 499 (6) Undergraduate Thesis – Design and execution of an experimental/analytical research project leading to preparation of a thesis. Prerequisite: Approval of the Head of Department. Consult before the end of classes in third year.
- 500 (2-6) c Graduate Seminar
- 501 (3) Agricultural Price Analysis – Theoretical and quantitative analysis of agricultural markets; empirical studies of demand for agricultural commodities and measurement of farm supply response. Prerequisite: Consent of instructor.
- 502 (3) Agricultural Market Institutions – Organization of the agricultural industry. Implications of structure, conduct and performance for farm supplier, farmer, wholesaler, retailer and consumer. Prerequisite: Consent of instructor.
- 503 (3/6) d 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.
- 508 (3) Advanced Production Analysis – Analytical and research procedures in production economics. Activity analysis. Production and supply functions. Simulation.
- 514 (3) Adult Education Program Planning Theory – Theoretical and conceptual perspectives on planning and evaluating education programs for adults. Exploration of the theoretical basis and utility of various approaches to planning and evaluation. (Same as ADED 514.)
- 515 (3) Adult Education Program Planning Practice – Application of planning and evaluation principles in specific adult education settings. Exploration of the practical utility of various approaches to planning evaluation. Prerequisite: AGECE 514. (Same as ADED 515).
- 520 (3) Land and Forest Resource Economics – Applications of advanced theory and quantitative analysis to problems in forest resource and land economics; multiple land use; institutions for sustainable land use; optimal management and policy. (Same as FRST 520.)
- 521 (3/6) d Topics in Agricultural Economics – A lecture course dealing with current topics of interest.
- 530 (2-6) c Directed Studies – On an approved problem.
- 540 (3) Agriculture in the Developing Economies – Role of agriculture in economic development. Technology, culture and institutions in developing countries—their relationship to agricultural development. Policies and problems.
- 548 (0) Major Essay
- 549 (12) Master's Thesis

Agricultural Sciences **AGSC**
FACULTY OF AGRICULTURAL SCIENCES

- 100 (0) Introduction to Agricultural Sciences – Orientation to study and career programs; survey of professional opportunities and requirements. [1-0; 0-0]
- 200 (3) Stewardship of Managed Landscapes – The relationship between agricultural, urban, and managed natural landscapes in sustainable development. (0-0-0; 3-0-2)
- 210 (3) Introduction to Food Production Systems – A study of the fundamental concepts and principles underlying food production systems. [0-0; 3-2]
- 213 (3) Genetics in Agriculture – The principles of genetics as applied to plants, animals and poultry. The inheritance of specific characters and the use of genetic variability to improve production of agricultural species. [0-0; 3-0-2]
- 220 (3) Critical Thinking – Argument analysis and evaluation in scientific reasoning and public discourse. (0-0; 3-2)
- 300 (2) Field Trip – Observing, recording and correlating agricultural facts in the field. One week of work is required of all students prior to Third Year entry. Staff and other members of the B.C. Institute of Agrologists. A fee will be assessed each student to cover the cost. (See Index under Fees "Special Fees".)
- 310 (3) Towards a Sustainable Agriculture – Approaches and constraints to global sustainable agriculture. Prerequisite: AGSC 200 or 210. (0-0; 2-2)
- 320 (3) Agricultural Ethics – Applying scientific and ethical reasoning to personal, public and corporate decision-making. Prerequisite: AGSC 220. (3-2; 0-0)
- 323 (3) Professional Communication – Principles and practice of written and oral communication. Electronic communication, technical writing, presentations. Prerequisite: 3 credits of first-year English. (2-0-2; 0-0)
- 410 (3) Topics in Sustainable Agriculture – An interdisciplinary assessment of problems and solutions in ecological agricultural systems. [0-0; 2-2]
- 421 (3) Topics in Agricultural Sciences.

Anaesthesia **ANAE**
FACULTY OF MEDICINE

- 450 (2) Introduction to Anaesthesia – Patient assessment and preparation for surgery, conduct of general and regional anaesthesia; their complications and management.

Anatomy **ANAT**
FACULTY OF MEDICINE

- 390 (4) Basic Human Anatomy – A lecture course presenting a general account of the structure of the human body by systems. Will include gross and microscopic anatomy. Prerequisites: BIOL 101 or 102 or equivalent or current registration in these courses.
- 392 (4) Gross Anatomy of the Limbs and Trunk – Lectures and laboratory sessions on the human gross and functional anatomy of the limbs and trunk. The course includes the study of predissected specimens. For credit only in the School of Rehabilitation Medicine.

- 400 (16) Human Anatomy – A correlated course of study for medical and dental students of the structure of the human body including gross and radiological anatomy and embryology. Clinics are held in cooperation with the Departments of Medicine, Orthopaedics, Surgery and Family Practice. Both terms.
- 401 (8) Microscopic Human Anatomy – A survey course for medical and dental students of the microscopic structure of the human body as studied by light and electron microscopy. Lectures and laboratory sessions. Both terms.
- 405 (3) Physiology and Biophysics of Animal Cells – A lecture course based on the molecular organization of cell components and dealing with the interpretation of selected functions of animal cells in terms of current theories. Prerequisites: CHEM 205, or equivalent, one of BIOL 350, BIOL 353, or PHYL 301. BIOC 300 or equivalent and MATH 200 recommended. [2-0; 2-0]
- 425 (4) Elements of Neuroanatomy – An introduction to the structure of the human nervous system. Given only in conjunction with PHYL 425. (Open to Medical and Dental students only)
- 500 (12) Gross Human Anatomy – An advanced laboratory course in the structure of the human body.
- 501 (6) Microscopic Human Anatomy – An advanced lecture and laboratory course in the microscopic structure of the human body.
- 502 (8) Microscopic Anatomy – The microscopic anatomy of tissues and organs in man. Prerequisite: ANAT 401 or equivalent.
- 504 (3) Cell Structure and Function – Seminar discussions of current topics in vertebrate cell biology.
- 505 (6) General Cytological Biophysics – An examination of selected properties of the cell and underlying mechanisms based on the ultrastructure of the cell and on the physical chemistry of open systems.
- 510 (4) Neuroanatomy – The gross and microscopic study of the nervous system in man.
- 527 (3) Muscle Biophysics – Selected topics in muscle contraction at an advanced level. Permission of Head required. (Same as PHYL 530.)
- 548 (2-6) c Directed Studies in Anatomy
- 549 (12) M.Sc. Thesis
- 550 (2) Current Topics in the Morphological Sciences – Lectures, demonstrations and discussions on selected and current topics in the anatomical sciences. Attendance is required of all M.Sc. and Ph.D. students in Anatomy.
- 649 Ph.D. Thesis
- 316 (3) Equine Biology, Health and Nutrition – Physiology, growth and reproduction of the horse; nutrition, diet formulation and feeding practices; common diseases, their prevention and treatment. Permission of instructor. [0-0; 3-0]
- 319 (5) Animal Physiology I – Physiological principles in domestic animals, including vital life support systems, cellular communication, growth and development. Prerequisite: BIOL 201. [3-2; 0-0]
- 320 (3) Animal Physiology II – Physiological systems of importance in animal production and wildlife management. Digestion, reproduction, lactation and environmental adaptation. Prerequisite: ANSC 319. [0-0; 3-2]
- 321* (3) Analytical Methods in Animal Nutrition – Principles of laboratory analysis in relation to assessment of the nutritive value of feeds and feed ingredients; laboratory exercises in feed analysis. Prerequisite: ANSC 322 or corequisite HUNU 305 and 307. Credit will be given for only one of ANSC 321 and HUNU 309. [0-0; 2-4]
- 322* (3) Fundamentals of Animal Nutrition – Essential nutrients and their functions; nutrient relationships and animal requirements in growth, maintenance, production and reproduction. Energetics in growth and production. Prerequisite: CHEM 230. Credit will not be given for both ANSC 322 and either HUNU 305 or 307. [3-0; 0-0]
- 323* (3) Experimental Nutrition – A laboratory course designed to illustrate principles of nutrition and to provide experience in the use of different species in nutritional studies. Prerequisite: ANSC 321 (this can be taken concurrently) and either ANSC 322 or HUNU 305 and 307. Credit will be given for only one of ANSC 323 and HUNU 309. [0-0; 2-3]
- 406 (3) Physiology of Reproduction – Physiological mechanisms related to reproduction, breeding efficiencies, fertility and milk secretion. [2-4; 0-0]
- 413 (3) Advanced Animal Breeding – Population dynamics under directional selection, biometrical genetics, estimation of genetic parameters and the theory of selection indices. Prerequisite: ANSC 313. Offered in alternate years. [0-0; 2-2]
- 414 (3) Animal Breeding Applied to Natural Populations – Population and quantitative genetic principles related to the dynamics of natural animal populations. Use of polymorphic and polygenic markers in estimating inbreeding levels, tolerance and rates in wild species. Effects of natural selection and inbreeding on population stability. Prerequisite: AGSC 213 or equivalent. Offered in alternate years. [0-0; 2-2]
- 417 (3) Animal Diseases – Basic pathological changes associated with mammalian, avian and fish diseases. Prerequisites: MICB 200 and ANSC 320. [3-2; 0-0]
- 420 (3) Animal Metabolism – A study of intermediary metabolism in domestic animals; the use of radioactive isotopes and other modern techniques in the study of metabolic processes in animals; in vitro rumen fermentation procedures; metabolic features of ruminant tissues. [2-4; 0-0]
- 421 (3) Monogastric Nutrition – The application of principles of nutrition to the economic and nutritional problems involved in feeding swine and poultry. Prerequisite: ANSC 322. [3-2; 0-0]
- 422 (3) Ruminant Nutrition – The application of principles of nutrition to the economic and nutritional problems involved in feeding ruminant animals. Prerequisite: ANSC 322. [0-0; 3-2]
- 423 (2) Seminar
- 424 (3) Behaviour of Ungulates – An introduction to the social behaviour, social organization and behavioural ecology of domestic and wild ungulates. Applied aspects of behaviour in livestock production and wildlife management are also covered. Recommended: BIOL 310 or PSYC 306. [2-2; 0-0]
- 425* (3) Comparative Nutrition – Qualitative and quantitative differences in nutritional requirements of terrestrial and aquatic species. Comparative physiology of digestion, metabolism and excretion. Efficiency of nutrient utilization. Nutrient sources and availability in the food supply of various species. Prerequisites: HUNU 305 and 307 or ANSC 321 and 322; a course in biochemistry; a course in physiology. [0-0-0; 3-0-2]
- 430 (2-6) c Directed Studies – On an approved problem.
- 437 (1) Avian Diseases – Common diseases of poultry, game birds and selected wild avian species. Disease prevention, with emphasis on the importance of proper management procedures in dealing with specific diseases. Prerequisite: ANSC 417. [0-0; 1-1*]
- 439 (3) Avian Physiology – Growth and reproduction, response to environmental factors, recent advances in endocrinology related to avian species. Prerequisite: ANSC 320. [0-0; 3-2]
- 447 (1) Livestock Diseases – Common diseases of livestock and selected species of wild animals. Disease prevention, with emphasis on proper management procedures in dealing with specific diseases. Prerequisite: ANSC 417. [0-0; 1-1*]
- 450 (3) Swine and Poultry Production – Application of biological principles to the breeding and management of poultry and swine. [3-2; 0-0]
- 460 (3) Beef and Dairy Production – Application of biological principles to the breeding and management of beef and dairy animals under extensive and intensive conditions. [0-0; 3-2]
- 480* (3) Intensive Fish Production – Management of fin fish throughout the life cycle: broodstock, egg, larvae and juvenile. Control of environmental factors, including pathogens, for maximum productivity at all life stages. Prerequisite: ANSC 320 or equivalent. [3-2; 0-0]
- 481* (3) Fish Nutrition – Physiology of digestion and excretion, nutrient requirements, sources of nutrients, diet formulation, feeding management. Prerequisite: ANSC 322. [0-0; 3-0]
- 482* (3) Fish Breeding in Aquaculture – Applications of animal breeding and genetic manipulation techniques for the improvement of domesticated fish species for aquaculture. Techniques for control of sex determination and differentiation. Prerequisite: ANSC 313. [0-0; 3-2]
- 487 (1) Fish Diseases – Common diseases of cultured and wild fish. Preventive programs in the control of disease will be emphasized in dealing with specific diseases. Prerequisite: ANSC 417. [0-0; 1-1*]
- 498 (3) Undergraduate Essay – Preparation of a comprehensive and analytical review of an approved topic under the supervision of a faculty member. Prerequisite: Approval of the Head of Department. Consult before the end of classes in third year.
- 499 (6) Undergraduate Thesis – Design and execution of an experimental/analytical research project leading to preparation of a thesis. Prerequisite: Approval of the Head of Department. Consult before the end of classes in third year.
- 500 (3) Graduate Seminar – Participation in this course is compulsory for all graduate students in Animal Science. See Graduate Studies section for details. [2-0; 2-0]
- 505 (3-6) c Reproductive Patterns in Domestic Animals. Seminar discussions of selected topics on advanced studies in reproductive physiology. (Not offered every year.)
- 506 (3) Advances in Poultry Development and Physiology – Recent advances contributing to the understanding of embryonic development; the role of hormones in macromolecular syntheses, hormone production, effect of teratogenic compounds and mechanism of action, nutrient requirements and metabolic changes occurring [2-3; 0-0]

Animal Science ANSC **FACULTY OF AGRICULTURAL SCIENCES**

Courses which have Science credit are marked with an asterisk

- 258 (3) Introduction to Animal Production Systems – The livestock and poultry industry; application of scientific principles to the production of various classes of livestock and poultry. [3-2; 0-0]
- 305 (3) Introduction to Feed Technology – Introduction to unit operations of feed technology. Physical and nutritional properties of feed and ingredients in relation to processing. Unit operations: size reduction (grinding, rolling), mechanical sorting, sifting and separation, mixing of solids, pelletizing and cubing, weighing and metering, cooling and drying. Conveying, handling and transportation systems. Process evaluation and quality control. [2-2*; 0-0-0]
- 307 (3) Experimental Embryology I – Avian embryonic development, structure-function interrelationships and laboratory techniques. [2-3; 0-0]
- 313 (3) Principles of Animal Breeding – Qualitative and quantitative genetic principles applied to animal improvement programs. Study and application of mating systems, evalu-

- 513 (6) Quantitative Genetics – Concepts and recent research in quantitative inheritance, behavioural and evolutionary genetics. (Not offered every year.) [3-0; 3-0]
- 514 (6) Applications of Quantitative Genetics – Population genetics, polygenic systems and selection theory as applied to animal populations. (Not offered every year.) [3-0; 3-0]
- 519 (3) Mineral Metabolism and Utilization in Domestic Animals – Requirements, metabolism and toxicology of macro and micro minerals. Credit will not be given for both ANSC 519 and HUNU 517. (Not offered every year.)
- 520 (3) Nutritional Physiology of Domestic Animals – Current topics in the study of nutrient metabolism in domestic animals; metabolic disorders. (Not offered every year.)
- 521 (3) Animal Energetics – Bioenergetics and growth; energy metabolism, utilization and requirements in domestic animals. (Not offered every year.)
- 522 (3) Protein Metabolism and Nutrition in Domestic Animals – Recent advances in the metabolism, utilization and requirements of proteins and amino acids in animals. Credit will not be given for both ANSC 522 and HUNU 511. (Not offered every year.)
- 523 (3) Vitamin Metabolism and Utilization in Domestic Animals – Requirements, metabolism, toxicology and utilization of vitamins in domestic animals. Credit will not be given for both ANSC 523 and HUNU 515. (Not offered every year.)
- 525 (2-6) d Advances in Comparative Nutrition – Qualitative and quantitative differences in nutritional requirements of terrestrial and aquatic species. Recent advances in the physiology of digestion, metabolism and excretion. Prerequisite: ANSC 425.
- 530 (2-6) c Directed Studies
- 533 (2-6) c Topics in Wildlife Behaviour, Management and Conservation
- 549 (12) Master's Thesis.
- 580 (3) Advanced Topics in Fish Culture – An interdisciplinary seminar course, involving disciplines of importance to fish culturists.
- 581 (3) Fish Diseases – Common diseases of fish. Epidemiology, zoonotic potential, prevention and treatment of diseases.
- 649 Ph.D. Thesis
- 201 (3/6) d Ethnic Relations – An introduction to the study of the relations between ethnic groups and of the interplay between ethnicity and other social factors. The course examines such concepts as: ethnicity, racism, prejudice, discrimination, assimilation, and multiculturalism. Ordinarily the course deals with ethnic groups in British Columbia, and students are expected to carry out elementary research projects. (Same course as SOCI 201.) [3-0] or [3-0; 3-0]
- 202 (3/6) d Contemporary Social Problems in Africa, Latin America – Cultural background to contemporary events; problems of nationalism and tribalism, economic and social development, religion and revolution. The area will ordinarily change each year. [3-0] or [3-0; 3-0]
- 213 (3/6) d Women in Comparative Perspective – An exploration of topics from Anthropology and/or Sociology focusing on explanations, in current and historical perspective, for variations in the situation of women. (Same course as SOCI 213.) [3-0] or [3-0; 3-0]
- 214 (3/6) d The Family in Cross-Cultural Perspective – A cross-cultural comparison of family and kinship to provide an understanding of variations in the structure and meaning of marriage relations; forms of domestic organization; and the sexual division of labour, property, and inheritance. (Same course as SOCI 214.) [3-0] or [3-0; 3-0]
- 215 (3/6) d Introduction to Japanese Society – Survey of contemporary Japanese life, with a focus on social organization and cultural patterns. Topics may include family, kinship, rural and urban conditions, economic organization, class and other inequalities, ethnic relations, and introduction of Western culture and value systems. (Same course as SOCI 215.) [3-0] or [3-0; 3-0]
- 217 (3) Culture and Communication – The study of communication; the relation between communication and its cultural context with emphasis on language, folklore, myth, ritual, and their social expression. [3-0]
- 220 (5) Native Peoples of British Columbia: Cultures and Resources – A study of traditional lands and cultures. [3-0]
- 221 (3) Native Peoples of British Columbia: Art and Myth – Traditional arts and myths, using the collections of the Museum of Anthropology. ANTH 100 is recommended as preparation for this course. [3-0]
- 300 (3/6) d Social Organization – The study of selected areas and communities drawn from: around the world with an emphasis on problems of cross-cultural comparison and on theoretical issues of current importance to the discipline. [3-0] or [3-0; 3-0]
- 301 (3) Native Peoples of British Columbia: Contemporary Issues – An examination of the relations between Native Peoples and non-Native Peoples cultures, with special reference to current Native Peoples situations and their anthropological background. Not for credit towards the Major or Honours degree. ANTH 100 is recommended as preparation for this course. [3-0]
- 302 (3/6) d Ethnography of South Asia – A specialized study of ethnographic and theoretical problems relating to South Asia. [3-0] or [3-0; 3-0]
- 303 (3/6) d Ethnography of Special Areas – A specialized study of ethnographic and theoretical problems in one area. Different culture areas or regions may be selected each term. Consult the Department for this year's offerings. [3-0] or [3-0; 3-0]
- 304 (6) Ethnography of the Northwest Coast – Specialized study of ethnographic and theoretical problems of the region. [3-0; 3-0]
- 305 (6) Theory in Archaeology – Explores models of culture change and culture used by prehistorians, with emphasis on formulation of research designs in order to work on specific problems in culture history, settlement, ecology, evolution, and technological change. The course views archaeological theory in relation to anthropological theory in general. Prerequisite: ANTH 103. [3-0; 3-0]
- 306* (6) Summer Field Training in Archaeology – Intensive training in excavation techniques and interpretation, including mapping procedures, recording, preliminary analysis, and reporting. Students will participate in an excavation for the summer session and will use this excavation as a basis for lectures, discussions and reports. Additional Field Trip Fees are charged for this course. See index under "Fees - Special Fees". Prerequisite: ANTH 305 or permission of the instructor. [3-3]
- 310 (3/6) d Urban Anthropology – Structure, organization, and development of non-western urban areas in their own context and in cross-cultural perspective. Fieldwork data collection in such settings. Evolution of non-western cities; urban process in relation to economic development; tradition and change in urban social organization; patterns of urban growth; problems of rapid urbanization; stratification, mobility and urban development; political process and change in urban development. [3-0] or [3-0; 3-0]
- 312 (3/6) d Gender Relations – The nature of gender relations, their social and cultural expression, and theories of gender inequality drawn from anthropological or sociological research. (Same course as SOCI 312.) [3-0] or [3-0; 3-0]
- 315 (3/6) d Japanese Culture and Society – An intensive examination of modern industrial Japan, including such topics as: demographic characteristics, class structure and inequality, industrial organization, political structure and conflict, ethnic relations, value systems, urban and rural traditions and cultural background of current events. Major theories of Japanese culture and economic development will be studied. (Same course as SOCI 315.) [3-0] or [3-0; 3-0]
- 316 (3/6) d Political Anthropology – Comparative study of primitive and tribal political organization; leadership and non-centralized and centralized political systems. [3-0] or [3-0; 3-0]
- 317 (3/6) d Linguistic Anthropology – A survey of the ethnographic uses of language data and the techniques of linguistic analysis. An introductory course in linguistics is recommended as preparation for this course. [3-0] or [3-0; 3-0]
- 318 (3) Old World Palaeolithic Archaeology – The archaeology of early human evolution, spanning the period from the emergence of the first tool-using hominids to the end of the Upper Palaeolithic and Mesolithic periods. Topics to be covered include: Lower and Middle Palaeolithic archaeology, adaptations of early hominids, emergence and spread of modern humans, Upper Palaeolithic technology and symbolism. Prerequisite: ANTH 103 or permission of the instructor. [3-0]
- 319 (3) The Emergence of Old World Civilizations – A survey of the archaeological evidence and theories for the origins and spread of settled village life, food production systems, and complex social and political organization. Begins with the Early Neolithic period and continues through to the appearance of the old world civilizations. Prerequisite: ANTH 103 or permission of the instructor. [3-0]
- 321 (3) The Canadian Far West in Prehistory – A survey of prehistoric archaeology west of the Rocky Mountains. Reconstruction of prehistoric cultural developments from the earliest migrations up to historical contact. Prerequisite: ANTH 103 or permission of the instructor. [3-0]
- 322 (3) Archaeological Foundations of East and Southeast Asia – Survey of the archaeology of East and Southeast Asia, with an emphasis on the beginnings of the economic, social, political, and artistic traditions and systems of the great civilizations, and the conditions in which they arose. Theories of cultural development emphasizing Neolithic and state-level societies will be discussed. Prerequisite: ANTH 103 or permission of the instructor. [3-0]
- 323 (3) Archaeological Foundations of New World Civilizations – A survey of the archaeology of Mesoamerica and Andean South America, concentrating on the origins and development of complex society. Theories on the evolu-

Anthropology
DEPARTMENT OF ANTHROPOLOGY AND
SOCIOLOGY, FACULTY OF ARGS

ANTH

ANTH 100, 103, 140, 201, 202, 204, 205, 206, 213, 214, 215, 217, 218, 220, 221, 301, 325, and 329 are general courses open to all students.

ANTH 100 is a prerequisite to all other third and fourth year courses, unless permission of the instructor is obtained. Some courses have additional prerequisites, as listed in the descriptions.

- 100 (3) Introduction to Cultural Anthropology – Basic concepts and methods of anthropology; culture and race; comparative study of social systems, religion, symbolism, art, and other institutions. Examples are drawn from a variety of cultures. [3-0]
- 103 (3) Introduction to Anthropological Archaeology – Survey of world prehistory, from the emergence of humankind to the beginning of civilizations, set in a framework of the principles of anthropological archaeology and cultural-historical research. [3-0]
- 140 (3) Introduction to the Study of Human Evolution – A macroevolutionary view of development of the genus *Homo*, examining fossil series of hominids with emphasis on the pre-Pleistocene precursors of the genus, and the morphology and behaviour of other primates. A neo-Darwinian, evolutionary perspective will be stressed. Not open to students in the Life Sciences in the Faculty of Science. [3-0]

- tion of civilization will be compared with the archaeological evidence. Prerequisite: ANTH 103 or permission of the instructor. [3-0]
- 325 (6) Introduction to Physical Anthropology – Origin and development of the hominids. Interaction between culture and hominid biology. Comparative primate anatomy of the Pleistocene fossil record. Anthropometric techniques for describing fossil and living populations. Topics in human genetics, especially population genetics. [3-0; 3-0]
- 329 (6) Native Peoples of Canada – Survey of Canadian Indian and Inuit cultures and the history of their colonization and integration. Reference may be made to such topics as administrative policies, research and development programs, and emergent native movements. [3-0; 3-0]
- 330 (3/6) d Peasants and the Third World – A comparative study of peasant society; relation of peasants to the national policy; social and cultural inhibition of development programs; the cultural bases of revolutionary action in the Third World. [3-0] or [3-0; 3-0]
- 331 (3/6) d Anthropology of Art – Anthropological perspectives on artifacts and symbolic forms: their production, use, and function in relation to technology, ecology, social organization, and cognitive structures. [3-0] or [3-0; 3-0]
- 332 (3/6) d Oral Tradition – An ethnographic perspective on the dynamics of oral tradition in various oral and literate cultures; the characteristics and roles of oral genres including folktale, genealogy, oral history, autobiography, and myth in these societies; and the relationship between orality and literacy. [3-0] or [3-0; 3-0]
- 333 (3/6) d The Analysis of Myth – The analysis of myth as performance and text; the relation of myth to social structure, symbolic analysis, comparative studies of myth, and the analysis of the structure of myth. [3-0] or [3-0; 3-0]
- 341 (3/6) d An Introduction to Museum Anthropology – The development of anthropology in museums from the late 19th century to the present day; material culture research; the study of museums as social institutions. The course is a prerequisite for ANTH 431 and 432. [3-0] or [3-0; 3-0]
- 350 (3/6) d Ethnography of the Pacific Islands: Polynesia and Micronesia – Major cultural groupings in Polynesia and Micronesia, emphasizing both traditional cultures and the incorporation of the region into modern international institutions. [3-0] or [3-0; 3-0]
- 351 (3/6) d Ethnography of the Pacific Islands: Melanesia – Major cultural groupings in Melanesia, emphasizing both traditional cultures and the incorporation of the region into modern international institutions. [3-0] or [3-0; 3-0]
- 353 (3) Ethnography of Latin America – Indigenous peoples of Latin America, emphasizing both pre-Columbian cultural traditions and socioeconomic and cultural changes from the Colonial period to the present. [3-0]
- 400 (3/6) d History of Anthropology – The development of the major approaches in anthropology in their institutional contexts. [3-0] or [3-0; 3-0]
- 401 (6) Native Peoples of North America – Native cultures of the United States and Canada; linguistic and cultural relationships; the culture of reserves and the reserve systems in both countries. [3-0; 3-0]
- 402 (3/6) d Ethnography of China – Advanced studies in the ethnography of China, premodern and contemporary. Topics may include kinship, rural and urban social structure, stratification and mobility, religion, national power structures, and social change in Chinese society. [3-0] or [3-0; 3-0]
- 403 (3/6) d Ethnography of Special Areas – An advanced study of ethnographic and theoretical problems. A different region may be studied each term. [3-0] or [3-0; 3-0]
- 406 (3/6) d Analytical Techniques in Archaeology – A survey of methods and techniques in the interpretation of archaeological data; practical experience in processing and analyzing archaeological materials by means of a research project. Students will prepare manuscripts, drawings and photographs for publication and will learn the basics of lithic and faunal analyses. Prerequisite: ANTH 305 or permission of the instructor. [3-0] or [3-0; 3-0]
- 407 (3) Principles of Field Work – An examination of field work as the basic setting for ethnographic research. Survey of field techniques and research design; the assessment of evidence for ethnographic conclusions. [3-0]
- 408 (3) Field Methods – Intensive examination and application of selected methods of ethnographic data-collection, e.g., anthropological interviewing, genealogies, ethnographic semantics, life-histories, oral traditions. Prerequisite: ANTH 407. [3-0]
- 409 (3/6) d Topics in Applied Anthropology – Advanced study of the theory and practice of applied, action, and consultancy anthropology. Topics may include the application of anthropology to education, medicine, development, women and development, tourism, native land claims, and other social issues. [3-0] or [3-0; 3-0]
- 410 (3/6) d Prehistory of a Special Area in Asia or Oceania – Analysis of the prehistory of a selected area, including a summary of the literature and the discussion of relevant problems. The course will provide background for students in area studies such as Oceania and the Far East. Prerequisite: ANTH 305 or ANTH 321 or permission of the instructor. [3-0] or [3-0; 3-0]
- 411 (3/6) d Prehistory of a Special Area in the New World – Analysis of the prehistory of a selected New World area, including a summary of the literature and discussion of relevant problems. The course will provide background for students in North, Central, and South American area studies. Typical offerings include the prehistory of Mesoamerica, the Southwest, North America and the Mayan areas. Prerequisite: ANTH 305 or ANTH 321 or permission of the instructor. [3-0] or [3-0; 3-0]
- 413 (3/6) d Family and Kinship – A cross-cultural survey of ways of defining family relationships and kinship organizations, including theoretical analysis as well as case studies. (Same course as SOCI 413.) [3-0] or [3-0; 3-0]
- 415 (3/6) d Religion and Society – Comparative study of religious beliefs, practices, and movements; relations between religious, social, and political institutions; religion as a force for stability and change; anthropological/sociological theories of religion. [3-0] or [3-0; 3-0]
- 416 (3/6) d The Ethnography of Japan – Through an analysis of contemporary ethnographic accounts of Japan, this course addresses the interplay of cultural predispositions with modern organizational structure, differences in rural/urban lifestyles, family relationships, gender roles, health, aging and Japan's international role. (Same course as SOCI 416.) Prerequisite: One of the following: ANTH 215, SOCI 215, ANTH 315, SOCI 315, or permission of instructor. [3-0] or [3-0; 3-0]
- 417 (3/6) d Language and Culture – The relationships between linguistic and cultural phenomena; how language affects normative and cognitive systems of thought and behavior. [3-0] or [3-0; 3-0]
- 418 (3/6) d Social Statistics – Primary emphasis on applications of statistical techniques to quantitative and qualitative data in both Anthropology and Sociology. Prerequisite: ANTH 218 or permission of the instructor. [3-0] or [3-0; 3-0]
- 420 (3/6) d Archaeology of British Columbia – An advanced study of the prehistoric archaeology of coastal and interior Native Peoples. A critical analysis of the archaeological evidence and interpretations of prehistoric cultural developments from the earliest migrations up to historical contact. Prerequisite: ANTH 305 or ANTH 321 or permission of the instructor. [3-0] or [3-0; 3-0]
- 422 (3) Modes of Subsistence – The nature of subsistence systems antedating or alternative to modern commercial systems. Introductory survey with basic readings; focus on problems such as the development of complex cultures without agriculture, the ambiguity of hunting and gathering, agricultural and other “intensification”, “orchestration” of the use of adjacent microenvironments. Of interest to students of archaeology, anthropology and cultural geography. Same as GEOG 422. [3-0]
- 424 (3/6) d Applied Archaeology – A review of the history and current practices of cultural heritage resource management. Includes legislative background and governmental organization as well as current practices in resource assessment and in salvage archaeology. The relationships between governments, consultants, sponsors and Native Peoples bands are explored with emphasis on recent developments. Prerequisite: ANTH 305 or permission of the instructor. [3-0] or [3-0; 3-0]
- 427 (3) Topics in Medical Anthropology – Anthropological perspectives on health, illness, and disability as represented by classic and contemporary research in selected topics in medical anthropology including disease and human evolution, illness and human ecology, culture and epidemiology, ethnomedical systems, the relationship between folk and biomedicine and the cultural construction and social organization of health care, illness and disability. Specific content will vary from year to year. Consult the Department brochure. Prerequisites: ANTH 100 or SOCI 100. [3-0]
- 431 (3/6) d The Care of Cultural Property – Care and cataloguing of collections utilizing the facilities of the Museum of Anthropology. Theoretical issues discussed in combination with laboratory projects. Special attention paid to the management of politically sensitive cultural property. Prerequisite: ANTH 341 or permission of the department. [2-2] or [2-2; 2-2]
- 432 (3/6) d The Anthropology of Public Representation – The public presentation and interpretation of anthropological concepts and materials utilizing the programs and facilities of the Museum of Anthropology. Prerequisite: ANTH 341 or permission of the department. [2-2] or [2-2; 2-2]
- 433 (3/6) d Directed Studies – General reading and/or a research undertaking, with the agreement, and under the supervision, of a Department faculty member selected by the student. No more than 6 credits of Directed Studies may be taken for credit toward the Major or Honours degree.
- 449 (6/12) d Honours Tutorial – Will usually require the presentation of at least one research paper.
- 451 (3/6) d Conservation of Organic Materials – Principles and elementary techniques for conserving organic ethnological and archaeological materials. Recommended for students intending to work with cultural materials. Open to Major and Honours students; other students by permission of the instructor. [3-2]
- 452 (3) Conservation of Inorganic Materials – Principles and elementary techniques for conserving inorganic ethnological and archaeological materials. Recommended for students intending to work with cultural materials. Open to Major and Honours students; other students by permission of the instructor. [3-2]
- 460 (3/6) d Cultural Ecology and Cultural Evolution – Social organization in the context of the theoretical approaches of cultural evolution and cultural ecology with particular emphasis on primitive societies: kinship, political organization, warfare, economic organization, peasant societies, religious movements, underdevelopment and social change. [3-0] or [3-0; 3-0]
- 470 (3/6) d Topics in Contemporary Theory – Selected topics in contemporary social and cultural theory which contribute to anthropological analyses. Topics may include Marxist anthropology, critical theory, theories of culture, phenomenology, behavioural ecology, structuralism, hermeneutics, formal theory and examination of specific social theorists. [3-0] or [3-0; 3-0]
- 495 (3/6) d Advanced Studies in Anthropology – An intensive examination of selected topics in Anthropology. Consult the Department for this year's offerings. [3-0] or [3-0; 3-0]

- 500 (6) History of Anthropological Thought – This course will consider various approaches to anthropology, from classical to contemporary.
- 501 (2-6) d Social Structure and Kinship
- 502 (2-18) d Advanced Ethnography of a Special Area
- 505 (2-6) d Religion and Society
- 506 (3/6) d Current Research in Anthropology – The relationship between current theoretical issues and research methods.
- 510 (3-6) c Comparative and Developmental Studies in Archaeology
- 511 (2-6) d Language and Culture
- 513 (3-6) d Advanced Studies in Feminist Anthropology – Feminist approaches to ethnography, theory, methodology; current issues in feminist anthropology; gender relations; feminist anthropology and postmodernism
- 515 (2-6) d Cultural Evolution and Cultural Ecology.
- 516 (5) Qualitative Methods in Anthropology – A discussion of selected methods used to observe, describe, and interpret cultural phenomena and social organization. The course will consider such techniques as participant observation, interviewing, ethnographic semantics, life histories, componential analysis and photography. Attention will also be given to ethics in anthropological research and writing and to such analytic matters as the nature of description, conceptualization, generalization and content analysis.
- 517 (3) Archaeological Methods – A discussion of selected basic data-gathering methods in their relation to the development of ideas about the archaeological record.
- 518 (3) Museum Methods – Analytical approaches to the study of museums and collections. Methods of field collecting, collections research, laboratory procedures, visitor studies, social organization of museum and related cultural industries, exhibit and program evaluation techniques and the ethics of museum research and practice. Prerequisite: ANTH 431 or permission of the instructor.
- 520 (2-6) c Advanced Prehistory of a Special Area
- 527 (3) Advanced Archaeological Methods – An intensive review of analytical approaches to the study of archaeological data and their applications. Includes research design, sampling strategies; analysis lab procedures; classification and typology; and multivariate analysis and other statistical procedures. Prerequisite: ANTH 517.
- 528 (3) Advanced Quantitative Methods – The purpose of this course is to introduce students to the anthropological application of a variety of quantitative techniques. Specifically there will be sections on sampling designs, analysis of variance and regression, multi-way contingency tables, and multivariate analysis. Topics will be presented initially in a series of lectures which will outline the logic and exhibit applications which have been made. Students will then be expected to generate their own application and presentation. Access to data files specific to the substantive field - cultural anthropology, archaeology, physical anthropology - will be provided. Prerequisite: ANTH 418
- 530 (2-6) d Social Change
- 532 (2-6) d Field Methods
- 534 (2-6) d Special Advanced Courses
- 540 (2-6) d Advanced Seminar
- 541 (2-6) d Advanced Seminar and Workshop on Museum Studies Prerequisite: ANTH 431.
- 545 (2-6) d Graduate Research Seminar
- 548 (0) Major Essay
- 549 (6/12) c Master's Thesis
- 551 (3/6) d Cultural Studies in Communication and Interpretation – History, theories, principles and techniques of communication and interpretation of cultural materials. Topics include examination of how various media (script, objects, film, video) are used to interpret histories, society, and culture in museums, art galleries, historic sites and related areas; and how communication programs are planned, implemented and assessed. Prerequisite: ANTH 431 or permission of the instructor.
- 649 Ph.D. Thesis

Applied Science
FACULTY OF APPLIED SCIENCE

APSC

- 110 (0) Co-operative Work Placement – Supervised, technical work experience in an established company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and the Co-operative Engineering Education Program.
- 121 (1) Society and The Engineer – The course deals with the social and cultural context within which engineering is practised. Specific topics may vary from year to year but typically include engineering ethics, professionalism, employment equity, multi-culturalism, gender, First Nations and environmental issues. [1-0-0; 0-0-0]
- 122 (0) Introduction to Engineering – Non-credit course designed to introduce students to Engineering. Information on the Faculty, the Profession and the particular skills and type of work done by practising Engineers in different disciplines. [0-0-0; 1-0-0]
- 151 (3) Computer-Aided Engineering Graphics – Orthographic projection, technical sketching, development of the ability to visualize in three dimensions. Standards and conventions of engineering drawing, graphical presentation of engineering data. Micro-computer based graphics aids. Engineering geometry and the solution of space problems. [1-0-1; 0-0-0] or [0-0-0; 1-0-1]
- 201 (3) Technical Communication – Written and oral communication in engineering. Report preparation, business correspondence and oral presentation of technical material. Prerequisite: 3 credits of first-year English. Credit will be given for only one of APSC 201 and ENGL 301. [1-0-2; 0-0-0] or [0-0-0; 1-0-2]
- 210 (0) Co-operative Work Placement – Supervised, technical work experience in an established company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and the Co-operative Engineering Program.
- 211 (0) Co-operative Work Placement – Supervised, technical work experience in an approved company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and Co-operative Engineering Program.
- 212 (0) Co-operative Work Placement – Supervised, technical work experience in an approved company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and Co-operative Engineering Program.
- 261 (3) Technology and Society I – The course deals with the influence of technology on the social, political, economic, and environmental aspects of society. The specific subject matter varies from year to year. Examples of subjects considered include: resources, energy, nuclear power, technology, the effects of technology on the family, education, agriculture, international policy and others. [2-0-1; 0-0-0]
- 262 (3) Technology and Society II – The course deals with the influence of technology on the social, political, economic and environmental aspects of society. The subject matter varies from year to year and differs from APSC 261. It may be taken as a continuation of APSC 261 or taken independently. Examples of subjects considered include pollution, work place health hazards, social impact of computers, problem solving, green revolution, technology and the third world, engineering ethics and others. [0-0-0; 2-0-1]
- 278 (3) Engineering Materials – Atomic bonding; crystal structures and imperfections; properties of metals, ceramics, polymers, wood, concrete and fibre composite materials; selection of materials; corrosion; mechanical testing and heat treatment. [3-2⁺-0; 0-0-0]
- 310 (0) Co-operative Work Placement – Supervised, technical work experience in an established company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and the Co-operative Engineering Education Program.
- 311 (0) Co-operative Work Placement – Supervised, technical work experience in an approved company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and Co-operative Engineering Program.
- 312 (0) Co-operative Work Placement – Supervised, technical work experience in an approved company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and Co-operative Engineering Program.
- 380 (3) Introduction to Microcomputers - An introductory course intended for potential users of microcomputers in real time or non-computational engineering applications. Topics include: perspective on applications and costs; basic microcomputer hardware; principles of microcomputer operation; introduction to microcomputer programming and software design tools; input-output devices including transducers, analog-to-digital converters, digital-to-analog converters; input-output methods and interface characteristics; selected case studies such as direct digital controllers and sensor-based systems. (Limited enrolment. Restricted to engineering students not taking Electrical Engineering.) [0-0-0; 2-3⁺-2⁺] or [2-3⁺-2⁺; 0-0-0]
- 410 (0) Co-operative Work Placement – Supervised, technical work experience in an established company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and the Co-operative Engineering Program.
- 411 (0) Co-operative Work Placement – Supervised, technical work experience in an approved company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and Co-operative Education.
- 412 (0) Co-operative Work Placement – Supervised, technical work experience in an approved company or organization for a minimum of 3 months. Technical report. Restricted to students meeting the requirements of the Faculty of Applied Science and Co-operative Engineering Programs.
- 450 (2) Professional Engineering Practice – Legislation affecting the practice of engineering; ethical principles and responsibilities. Management of engineering enterprises; labour relations, safety and environmental legislation. Restricted to engineering undergraduate students in the final year of their degree program. [2-0-0; 0-0-0]
- 459 (5) Engineering Physics Project I – Projects designed to give students research development and design experience. Projects provided by research faculty in Science and Engineering and from local industry. [1-3-0; 0-6-1]
- 479 (4) Engineering Physics Project II – Projects designed to give students research development and design experience. Projects are provided by research faculty in Science and Engineering and from local industry. Prerequisite: APSC 459. [0-5-1; 0-2-1⁺]
- 480 (3) Engineering Physics Projects III – An optional course for those students wishing to continue their project work beyond the development in APSC 479. Prerequisite: APSC 479. [0-0-0; 0-5-1]
- 510 (4) Advanced Technology Internship – Work in a technological setting on commercial and managerial aspects of an industrial project. A required internship to be taken at the end of the first year of the M.Eng. (Advanced Technology Management) program.

- 511 (2) Advanced Technology Management Colloquium – Student reports on internship, guest speakers from industry, preparation of group projects, joint study of industrial reports. Required of students enrolled in the M.Eng. (Advanced Technology Management) program.
- 530 (6) Principles of Design of Biomedical Devices – Concepts, design and manufacturing methods applied to biomedical devices. A supervised long-term project involving the design of a medical device for specific diagnostic or therapeutic function, and an engineering report, are required.
- 550 (3) Biomedical Measurements and Biomaterials – Biocompatible materials for measurement and therapeutic purposes. Principles and technology of measuring temperature, displacement, motion, force, pressure, flow, ions, dissolved gases and bio-electric potentials in living organisms. [3-3*-0; 0-0-0]
- 552 (2) Clinical Engineering Seminar – Topics covered will vary somewhat from year to year but include principles of pharmacology, drugs as therapeutic agents, principles of chemotherapy, principles of hospital safety, ultrasonics, optics, legal and managerial aspects of Clinical Engineering, student reports on internship projects. [0-0-2; 0-0-2]
- 554 (6) Directed Studies in Clinical Engineering – Supervised work on several clinical engineering projects in local hospitals.
- 556 (3) Clinical Engineering Practice – Principles of professional clinical engineering practice, functions, organization and operation of hospital-based clinical and biomedical engineering departments.
- 597 (6) Project for M.Eng. Program in Pulp and Paper Engineering – Project on an assigned topic in student's field of specialization. Literature search, evaluation, mill visit to collect data, analysis of data and project report.

Arabic **ARBC**
DEPARTMENT OF RELIGIOUS STUDIES, FACULTY
OF ARTS

- 300 (6) Introduction to the Grammar and Vocabulary of Classic Arabic. – Open to first- and second-year students with the permission of the instructor. [3-0; 3-0]
- 400 (6) Intermediate Classical Arabic – Second year of Classical Arabic with extensive reading of poetry and prose drawn from religious and historical texts. Prerequisite: ARBC 300 or equivalent. [3-0; 3-0]

Archaeology
SEE FACULTY OF ARTS

Architecture **ARCH**
SCHOOL OF ARCHITECTURE, FACULTY OF
APPLIED SCIENCE

**Additional fees are charged for these courses. See Index "Fees - Special Fees".

- The bracketed [] 400-level course numbers are applicable to students admitted under the B.Arch. degree program and to undergraduate students taking courses open to students outside the School of Architecture. The 400-level course numbers will be discontinued September 1, 1999.
- The 500-level course numbers are applicable to students admitted under the M.Arch. and M.A.S.A. degree programs and to graduate students taking courses open to non-Architecture students.
- 407 (3) Research Methods for Architects – Qualitative and quantitative investigative and evaluative tools and techniques appropriate for designers during various stages of project implementation.
- 408 (3) Social Aspects of Architectural Space – Development of design principles and applications of specific social theory in architecture, including N- and P- spaces, overload and span of social control, variety and monotony, privacy and crowding, proxemics, front- and back-stages,


defensible space and territoriality, and environmental knowing. Lectures, graphics, student presentations.

- 410 (3) Workshop: Architectural Graphics – Study and explanation of drawing and other graphic media as a means of communication and expression in architecture.
- 411 (0) Computer Workshop – A non-credit six-hour workshop to introduce architectural students to the computing environment, to comprehend basic operating and logical principles, to become familiar with the School's computing system, and to appropriate potential applications.
- 430 (3) Architectural Acoustics – This course will review and reinforce basic theory and concepts, including human response to sound. The emphasis of the course will be placed on the control of noise and vibration in buildings and in the achievement of optimum listening conditions for speech and music. Prerequisite: ARCH 452.
- 450 (3) Design Management – Review of factors that are the basis for the change of scale of architectural projects and the greater mechanization of the building industry. Architectural design as resource management and the optimization of design solutions within different contexts are discussed. The design and development process will be reviewed to include significant concepts and approaches which determine the quality of architecture. The topics will include: design methods, energy standards, life-cycle costing, design-build, construction management, and project planning, etc. Prerequisite: ARCH 423.
- 451 (3) Process and Practice of Architecture 2 – Expansion of the professional role of the architect; management and business aspects of practice. Prerequisite: ARCH 423.
- 500 [400] (9) Architectural Design IA – Studies and exercises using the project method as a means of problem-solving in the area of the man-made environment. Stimulation of creative ability and the development of skills important to the architect. Prerequisite: ARCH 502 [406].
- 501 [401] (9) Architectural Design IB – Description as for ARCH 500 [400].
- 502** [406] (2) Workshop – Experiments in specially selected environmental situations. Usually carried out during an extended field trip in order to emphasize a mutual faculty and student "living and learning" experience. Architects and others in related fields are invited to lead a series of discussions and to participate in various projects. The workshop is usually offered during the last two weeks of August. It is required that students attend the workshop before being admitted to ARCH 500 (400) in the Fall. (A non-refundable fee will be charged to cover expenses.)
- 503 [413] (3) Introduction to Issues and Ideas in Architecture – Lectures and discussions about issues and ideas in architecture intended to dispel misconceptions about this field, and to provide insights into what it is and the context within which it is realized. First-year students take it concurrently with ARCH 500 (400), Arch Design IA.
- 504 [404] (3) Architectural History Ia – Origins of contemporary architectural thought. A survey of the theories, technological and social changes which have influenced architecture and related fields since the 18th century.
- 505 [405] (3) Architectural History Ib – Developments in modern and contemporary architectural thought. Critical analysis of the contribution of the 20th century producers of architecture, engineering, and industrial design.
- 509 [409] (3) Introduction to the Behavioural Basis of Design – A survey of man-environment relations, human factors, social theory and research for architects.
- 511 [426] (3) Architectural Technology 1 – Introduction to architectural technology considering design objectives and requirements for building structures, environmental conditions and enclosure systems. Study of building materials, including properties, applications and performance.
- 512 [416] (3) Architecture Structures 1 – Introduction to the "structural problem" through investigation of the inter-relationships between force, geometry and material and their effects on structural elements. Expansion of these

effects on individual elements, into the context of the structure as a system and their relation to the form, safety, and economy of the structural system. Development of a quantitative analysis and design of simple beams and qualitative expansion of the ideas into more complex elements. The intent of the course is to allow the student to create a context for the knowledge of, and feeling about structures and their role in architecture. Prerequisite: ARCH 511 [426].

- 513 [452] (3) Environmental Systems and Controls 1 – Building form and fabric considerations to assure appropriate thermal, luminous, sonic, and atmospheric conditions within buildings.
- 515 [412] (2) Techniques Workshop – Lecture demonstrations and assignments which will assist students in the design tutorials to master skills and techniques relevant to the design process. Topics vary according to need.
- 517 [417] (3) Computer Applications in Architecture 1 – Instruction in three major topic areas: Computer Graphics (fundamentals, data organization and interactive systems), Project Management (scheduling, resource allocation and cost control), and Space Planning (programming, utilization and design). Computing facility developed in context through hands-on experience and access to program libraries. Prerequisite: ARCH 411.
- 520 [420] (9) Architectural Design 2A – Studies and exercises using the project method as a means of problem-solving in the area of the man-made environment. The stimulation of creative abilities and the further development of skills important to the architect.
- 521 [421] (9) Architectural Design 2B – Description as for ARCH 520 [420].

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- 522 [446] (3) Current Issues in Architecture – A seminar examining current issues in Architecture, based on reading assignments, papers and presentations. Enrolment is limited to facilitate discussion.
- 523 [445] (3) Current Theories of Architecture – A seminar covering current theories of architecture, based on reading assignments, papers and presentations. Enrolment is limited to facilitate discussion.
- 524 [424] (3) History of Urban Form – A survey of the physical forms of cities and their relationship to the cultures with which they are associated. Open to students outside the School.
- 525 [425] (3) Workshop: History of Urban Planning – Exploration of 19th and 20th century theories of planning and urban form. The workshop format will allow students to experiment with these ideas in model form. The relevance of these theories and ideas to the form of modern cities will be evaluated. Open to students outside the School (see also School of Community and Regional Planning listing).
- 526 [448] (3) History of Theories of Architecture – An advanced seminar in architectural history concentrating on detailed study of the literature on selected architectural theories which have had an effect on twentieth century architectural form.
- 527 [471] (3) Meaning in Architecture – Issues pertinent to architectural meaning including: environmental perception, cognition, and evaluation; meaning, communication and signification; cognitive mapping; archetypal place; urban comprehensibility and morphology. The significance of these issues to the design process and the generation of form in the built environment.
- 528 [472] (3) Meaning and Behaviour in the Landscape – Selected topics from the literature of other disciplines pertaining to the design and interpretation of the landscape.
- 529 [473] (3) Introduction to Facilities Programming – Examination of the pre-design process employed to clarify project objectives, define client/user requirements, test alternative organizations, generate space-planning schemata, involve users in the development of design parameters and critical environmental and technical performance criteria. Prerequisite: ARCH 541 [423].
- 530 [447] (3) Urban Design Workshop – This course will survey the techniques involved in the process of architectural analysis and design at urban scale. Also included will be studies of design strategies for the implementation of design policies, guidelines and bylaws related to city form, image and aesthetics. Lecture, seminars and student papers. Limited to 15 students.
- 531 [427] (3) Architectural Technology 2 – Primary building elements characteristic of traditional North American building construction as well as aspects of more complex building technology. Materials and methods will be considered in the context of performance requirements, building regulations and contract documents.
- 532 [436] (3) Architectural Structures 2 – Utilizing the basic principles established in ARCH 512 [416] develop an operational facility in designing wood frame structures for general loading such as are found in residential construction. Quantitative investigation and comparison of wood, steel and concrete elements and structural systems with emphasis on horizontally spanning elements. Qualitative study of other structural elements such as walls, columns, foundations, etc. Introduction to earthquakes and lateral force for resisting systems. Prerequisite: ARCH 512 [416].
- 533 [454] (3) Environmental Systems and Controls 2 – Mechanical and electrical services of buildings and their integration with architectural form and fabric. Prerequisite: ARCH 513 [452].
- 534 [431] (3) Light, Colour and Space – A quantitative examination of light and colour in spatial perception. The tools, techniques and quantities used in lighting design together with their application to specific problems. Lectures, laboratories and seminars. Prerequisite: ARCH 513 [452].
- 535 [455] (3) Energy and Building Design – Lecture course which explores the factors leading to the design of energy efficient buildings. Course covers heat transfer concepts, internal planning, site planning, form implications, fabric implications, predictive techniques. Prerequisite: ARCH 513 [452].
- 537 [419] (3) Computer Applications 2 – Individual investigation and development of computer applications to selected topics in architectural practice. Prerequisite: ARCH 517 [417] or permission of instructor.
- 538 [461] (9) Study of Architecture Abroad – A prearranged program concerned with a particular locality in which a unique quality of architecture and specific architectural problems are to be found. The program will cover fields of study, the contents of which would in ordinary circumstances be advanced by the faculty had they remained in Vancouver. Accordingly, credit for 539 [460] and 538 [461] are together equivalent to one term's work in Vancouver, and credit for 538 [461] will be accepted in lieu of three, three-credit courses, while credit for ARCH 539 [460] will be accepted in lieu of credit for ARCH 501 [401], 520 [420], 521 [421] or 570 [440]. The problems undertaken in 539 [460] will be project-oriented and related to the locale. The course ARCH 538 [461] will consist of lectures, seminars, individual research, and field trips. Students electing to participate in the program must be prepared to meet additional expense. This program will be arranged according to academic need within the School and current opportunities for travel. The program is not available to students in their first year.
- 539 [460] (9) Architectural Design Abroad
- 540 [440] (9) Architectural Design 3A – Studies and exercises of a nature related to problems in man-made environment. Such studies and exercises aim at understanding the environment, of human responses to it and the means the architect may use for defining and solving problems.
- 541 [423] (3) Process and Practice of Architecture 1 – An overview of the complex processes by which architecture is realized and the professional role of the architect within them.
- 542 [422] (1) Project Costing – This short course provides an overview of how project costs are determined, and how relative costs of various alternative elements, components, or configurations can provide a useful basis for design decisions.
- 543 [442] (3) Housing and Community – Investigations into the inter-relationships between housing and urban form; examination of the relevant theories and their consequences in terms of architecture.
- 544 [458] (3/6) d Architectural Seminar – An explanation of selected topics in architecture. Course enrolments will be restricted. Permission of instructor required.
- 545 [459] (3/6) d Directed Studies – An exploration of selected topics in Architecture. Available to individual students with the agreement of a member of the faculty available to supervise the work.
- 548 [498] (3) Graduation Design Project - Part 1: Project Report – An in-depth exploration of a social, urban or environmental problem leading to the definition of parameters for an architectural design solution brought to resolution in the form of a major Report as preparation for ARCH 549 [499]: Part 2. Graduation Design Project.
- 549 [499] (9) Graduation Design Project – Part 2 – The development and resolution of the design project set out in Arch 548 [498] Graduation Design Project: Part 1. Project Report Preparation, to be carried out under the direction of a Committee of faculty and outside professionals.
- 562 (3) Advanced Theory – Relationship between environmental issues and issues of 'place'. How environmental issues are seen as both a responsibility, and as a powerful vehicle for redefining a sense of place. Prerequisite: ARCH 513 [452].
- 565 [458] (3/6) d Planning the Residential Environment – Studies of the principles of physical development of residential sites in metropolitan areas and their architectural ramifications. Field trips included.
- 568 [467] (3) Research methods in Architecture – Methods for research in architectural design, cross cultural factors, history and theory, physical sciences and environmental issues.
- 571 (3) Advanced Seminar on Building Technology – Historical development of building enclosure, new materials and construction methods, design-construction process, failure evaluation, and current research issues. Prerequisites: ARCH 512 [416], 513 [452], 531 [427].
- 572 [456] (3) Advanced Structures – Explorations of historical structures, structure in current architectural theory, advanced structural technologies, and behaviour of specific structural materials and systems. Prerequisite: ARCH 512 [416].
- 573 [485] (3) Special Topics in Architectural Technology – Exploration of aspects of architectural technology and advanced techniques in building. Prerequisite: ARCH 511 [426], 531 [427], 513 [452], 512 [416].
- 577 (3) Seminar in Advanced Computer Applications.
- 580 (0) Architecture Seminar – A forum for the exchange of ideas and presentation of papers by faculty, students and visitors.
- 583 (3/6) d History of Architectural Theory and Philosophy – The exploration and analysis of theories and philosophies of architecture and design, and the ways in which they affect architectural form.
- 584 (3/6) d Programming for Building Users – Examination of theories related to value-laden and probabilistic decision-making in architectural programming. Prerequisite: ARCH 529 [474] or equivalent experience with architectural programming or management.
- 585 (3/6) d History of Housing – Segments of the history of housing. Selected according to faculty availability and student interest.
- 586 (3/6) d Facilities Programming – Individual and/or group study of advanced facilities programming for complex projects.
- 587** (3/6) d Urban Design Studies – Individual and/or group design exercises to develop architectural strategies within the context and scale of urban developments.
- 588 (3/6) d Advanced Building Science – Study of scientific technique applied to the design and appraisal of the built environment and its performance.
- 597 (3/6) d Special Topics – Individual or small group study of special topics.
- 598 (12) Thesis for the M.A.S.A. Degree

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- 510 (3) The Nature of Archival Materials – The characteristics of archival documents, their genesis, forms, aggregations, and their relationships with the facts, acts, and events embedded in them.
- 512 (3) Indexing – Theory and application of techniques such as vocabulary control, indexing languages, thesauri, design of access points, and precision/recall devices to provide intellectual access to information. Same as LJBR 512.
- 515 (3) Arrangement and Description of Archival Materials – The methods of identification of archival finds; principles and methods of arrangement and description; standards of description; preparation of finding aids.
- 516 (3) Records in Office Systems – Structure and characteristics of integrated office systems; design and implement-

tation of records classification and scheduling; legal, security, and access issues.

- 517 (3) Record Keeping – An historical examination of practices in the making and keeping of records and of the nature of record repositories in different societies from antiquity to the present.
- 519 (3) History of Archival Concepts – Origins and development of archival concepts, principles, and methods through an examination of laws, literature, and instruments of archival practice internationally. Same as LIBR 519.
- 520 (3) Selection and Acquisition of Archival Documents – The formation of society's documentary heritage; the concepts of selection and acquisition and their evolution; acquisition policies; principles and methods of evaluation; means for establishing physical and legal control over accessions.
- 530 (3) The Juridical Context of Canadian Archives – Canadian legal principles and administrative structures related to the creation, maintenance, control, use, and communication of public and private archival documents.
- 540 (3) Archival Public Services – Organization and provision of reference service; user needs and types of use of archives; legal and security concerns; methods of increasing accessibility of archival materials; public programs.
- 551 (3) Access and Retrieval Systems – Principles of content analysis and representation; documentary languages; process of design and implementation of systems for storage and retrieval of information; authority control; all in the context of archival information systems.
- 555 (3) Management of Electronic Records – Information capture, processing, storage, and communication technologies in recordkeeping; the role of standards in supporting integrated systems; methods for the maintenance and disposition of electronic records. Same as LIBR 555.
- 570 (3) Management of Libraries and Archives – An introduction to contemporary management theory and its application in the administration of libraries and archives. Same as LIBR 570.
- 573 (3) Archival Systems and the Profession – A comparative analysis of the statutory basis, organization, policies, and traditions of contemporary archival institutions and programs. The responsibilities, values, and culture of the archival profession and its role in developing archival systems.
- 587 (3) Preservation – Characteristics of storage media for documents; environmental, biological, and technological factors in their deterioration and methods of counteracting them; management of preservation programs. Same as LIBR 587.
- 590 (3) Research Methods in Libraries and Archives – Principles and methods of research and investigation and their application to various situations in libraries and archives. Same as LIBR 590.
- 592 (3-6) c Directed Research Project Prerequisite: 590.
- 593 (3-6) d Seminar – Topics in the administration or use of archives.
- 594 (3-6) c Directed Study
- 595 (3) Internship – Practical work of at least one month's duration in a recognized archival repository under the supervision of a senior archivist and offering experience of the basic archival functions.
- 598 (0) Major Essay
- 599 (12) Thesis

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- 201 (3) Canada, Japan and the Pacific: Cultural Studies – An interdisciplinary introduction to the cultures of Canada and Japan, and the interrelations between them. Specific topics vary from year to year but will include themes such as constructing the past; nationalism; self-perceptions; cross-cultural perceptions; multiculturalism in Canada and Japan; images in architecture, film and literature; mythologies. [0-0; 2-1]
- 202 (3) Canada, Japan and the Pacific: Political, Economic and Geographical Perspectives. – An interdisciplinary introduction to political, economic and geographical interactions between Japan and Canada, the links between these countries and other Pacific Rim nations, and the historical origins of these connections. Specific topics will vary from year to year, but will include themes such as economic integration in the Pacific region; the role of resource economies such as Canada's; security relations in the Pacific; the role of Japanese investment in the Asia-Pacific region. [0-0; 2-1]
- 400 (3-6) d Interdisciplinary Studies in Arts – For upper division students in the Faculty of Arts. Topics announced annually.
- 401 (3-6) d Special Topics in Arts Studies – For upper division students in the Faculty of Arts offered by a distinguished visitor to the campus for one or two terms.

Asian Studies
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ARTS

Asian Languages

- 300 (6) Studies in an Asian Language (Basic Course) – Introduction to the fundamentals of an Asian language not normally taught in the Department. Not given every year. Consult the Department for details. [3-1; 3-1]
- 400 (6) Studies in an Asian Language (Intermediate Course) Prerequisite: ASLA 300 or permission of the instructor.
- 105 (6) Introduction to East Asia – Geographical, ethnic, and historical backgrounds of China, Japan, and Korea. Survey of twentieth-century East Asian History. Same as HIST 171. [3-0; 3-0]
- 115 (6) Introduction to South Asia – Geographical, cultural, and historical backgrounds to India, Pakistan, Bangladesh, and Sri Lanka. Problems of political, economic, and social development since 1947. Same as HIST 170. [3-0; 3-0]
- 206 (6) Introduction to Southeast Asia – Geographical, cultural, and historical backgrounds of Indonesia, Malaysia, Singapore, Brunei, Burma, Thailand, Kampuchea, Laos, Vietnam, and the Philippines. Problems of nationalism, foreign policy, economic and social development since 1941. Open to first year students. Same as ANTH 206. [3-0; 3-0]
- 225 (6) Introduction to Japanese Culture – Literature, theatre, cinema, painting, religion, traditions, customs, festivals, and crafts; their mutual relationships; the relationship between material and non-material culture. Not offered every year. [3-0; 3-0]
- 270 (6) Modern China and the West – Same as HIST 270. [2-1; 2-1]
- 302 (6) Chinese Literature in Translation – An introduction to Chinese literature from ancient times to c. 1800. [3-0; 3-0]
- 320 (6) History of Chinese Civilization – A survey of Chinese history and culture from ancient times to 1840, with emphasis on the period up to A.D. 1000. Same as HIST 382. [3-0; 3-0]
- 321 (6) The Civilization of Late Imperial China – Evolution of Chinese civilization from c. 1000 to 1600. The cultural and political legacy of the Sung period; the impact of the period of Mongol domination; the Ming period. Cultures

of peoples who ruled part or all of China will be touched upon. Not offered every year. Same as HIST 381. [3-0; 3-0]

- 322 (6) History of Korean Civilization – The evolution of a distinctive Korean civilization within the East Asian cultural sphere. Primary focus on cultural, social, and political developments from the earliest times to the nineteenth century. Same as HIST 386. [3-0; 3-0]
- 324 (3) Contemporary Korean Culture – An introduction to the literature, drama, music, and art of Korea today. Particular attention will be paid to the continuing influence of traditional themes and forms. No prerequisites. [3-0]
- 325 (6) History of Chinese Thought – The development of Chinese philosophy and ethics from their beginnings through the nineteenth century, with emphasis on Confucianism, Taoism, and Buddhism. Attention will be given both to ideas themselves and to their relationship with the cultural context. Also listed as PHIL 371. [3-0; 3-0]
- 327 (3) History of Korean Thought – An examination of Korean religious, philosophical, and scientific thought from the earliest written records to the present day, with particular focus on the interaction of Shamanism, Buddhism, Confucianism, and, in the present century, Christianity. No prerequisites. [3-0]
- 330 (6) History of Japanese Civilization – Japanese political, social, and cultural history from the earliest times to 1868. Same as HIST 383. [3-0; 3-0]
- 335 (6) Traditional Japanese Literature in Translation – An introduction to Japanese literature from the earliest times to mid-nineteenth century. [3-0; 3-0]
- 340 (6) History of Indian Civilization – Political and cultural history from the earliest times to the Medieval period. Same as HIST 384. [3-0; 3-0]
- 345 (6) Indian Literature in Translation – A survey of classical and modern literature in translation. [3-0; 3-0]
- 347 (6) Performance Traditions of South Asia – Classical and folk forms of music, dance, theatre, and cinema in their literary, religious, and social contexts. [3-0; 3-0]
- 350 (6) The Mythological Literature of South Asia in Translation – The texts will be selected so as to present the stages in the history of South Asian literatures, the types of South Asian myths, and the variety of literary representation that myths enjoy in South Asia. Not given every year. [3-0; 3-0]
- 355 (6) Philosophical Tradition of India – Introduction to various schools of Indian philosophy from the standpoint of analytical philosophy. Reading of (a) articles and books in English surveying the secular component in the Indian philosophical tradition, and (b) English translations of Sanskrit texts discussing epistemological and ontological issues, including those texts which realize the relevance of language in discussing these issues. Not given every year. Also listed as PHIL 372. [3-0; 3-0]
- 357 (6) The Hindu Religious Tradition – Formation of Hinduism through the various periods of its history in interaction with indigenous movements and foreign religions. An overview of philosophical schools, religious doctrines, rituals, myths, and religious organizations. Same as RELG 354. [3-0; 3-0]
- 360 (6) The Sikhs: History, Religion and Society – A historical study of the social and cultural forces that helped shape Sikh religious beliefs and ritual practices over the past four centuries. In dealing with the evolution of Sikh identity, due attention will be given to Sikh ideals, social organization, religious institutions, and sacred literature. Same as HIST 389. [3-0; 3-0]
- 362 (6) History of Indonesian Civilization – A historical survey of the Indonesian archipelago from the tenth century to the present. Attention will be given to the rise of commercial cities, the development of bureaucratic states, and the elaboration of major religions, all of which bridged the cultural diversity of the islands. In the second term the emphasis will be on twentieth century Indonesia. [3-0; 3-0]

- 365 (3) Daoist (Taoist) Religion and Its Philosophical Background. – A study of the Daoist religious traditions from their beginnings in the second century C.E. in their cultural, intellectual and social contexts. Same as RELG 365. [3-0; 0-0]
- 366 (3) Buddhism in China – History, thought and practices of Chinese Buddhism from its beginnings until the twentieth century. Same as RELG 366. [0-0; 3-0]
- 368 (3) Common Religious Traditions in China – A study of the religious practices and beliefs shared by the great majority of people in traditional Chinese culture, including ancestor worship, seasonal festivals, offerings to deities, exorcism of harmful forces. Same as RELG 368. [0-0; 3-0]
- 370 (6) Studies in the History of a Major Asian Civilization. – Study of an Asian culture area different from those covered in existing courses. Not given every year. Consult Department for details. [3-0; 3-0]
- 375 (6) A Specific Asian Literature in Translation – Introduction to the literature of a linguistic area of Asia not covered in existing courses. Not given every year. Consult the Department for details. [3-0; 3-0]
- 380 (6) Modern Chinese History since 1840 – Same as HIST 380.
- 385 (6) History of India since 1800 – Same as HIST 385.
- 387 (3) Medieval India – The history, culture, and social and economic organization of South Asia from the decline of the classical Hindu empires through the Sultanate period. (Same as HIST 387.) [2-1]
- 388 (3) Mughal India – History of the politics, economy, society, and culture of South Asia from the Great Mughals to the British conquest. (Same as HIST 388.) [2-1]
- 405 (6) Communist Movements in East Asia – A survey of the growth, organization, ideology, and programs of Communist Parties in East Asia since 1920, with special emphasis on the Chinese Communist movement and the Chinese People's Republic. Not offered every year. [3-0; 3-0]
- 415 (6) Modern Chinese Fiction in Translation – Reading of selected novels and stories written between 1750 and the present. Not given every year. [3-0; 3-0]
- 417 (6) Chinese Political Thought and Institutions – Chinese theories and practices of government and administration from earliest times to 1949. Same as POLI 424. [2-1; 2-1]
- 420 (6) Contemporary South Asia – Problems of modernization and external relations of India, Pakistan, Bangladesh, and Sri Lanka since 1947. [3-0; 3-0]
- 422 (6) Modern Japanese History since 1800 – Same as HIST 422. [3-0; 3-0]
- 423 (3-6) d Individualism in Modern Japan – The individual in conflict with tradition and the state in the late nineteenth and twentieth centuries. [3-0] or [3-0; 3-0]
- 424 (3-6) d Topics in Classical Japanese Literature – Selected topics in classical Japanese literature in translation focusing on individual genre, works, periods or movements. Offered alternative years. Prerequisite: ASIA 335 (001), or consent of the instructor. [3-0] or [3-0; 3-0]
- 434 (6) History of Southeast Asia since 1800 – Same as HIST 434. [3-0; 3-0]
- 435 (6) Modern Japanese Novels in Translation – A critical examination of representative works in Japanese fiction from 1868 to the present. [3-0; 3-0]
- 438 (3) Problems in International Relations – South Asian States in World Affairs – See International Relations, Faculty of Arts. [3-0]
- 445 (6) Modern South Asian Fiction – Nineteenth and twentieth century novels and short stories, in English translation, or the original English. Given in alternate years. [3-0; 3-0]
- 447 (3) Modern Drama of India – Nineteenth and twentieth century plays, in the context of South Asian theatrical traditions. All texts in English. Given in alternate years. [3-0]
- 450 (6) History of Rural Societies in Asia – A study of the historical structures and transformations of rural societies in Eastern, Southeastern, and Southern Asia, from the eighteenth century. Same as HIST 482. [3-0; 3-0]
- 480 (6) Economic and Social History of Modern China to 194 – Same as HIST 480. [3-0; 3-0]
- 501 (3/6) d Research Methods and Source Materials in Classical Chinese Studies. – Note: Courses with a maximum of 18 credits may not be taken for more than six credits in any one topic.
- 502 (3/6) d Modern Chinese Fiction and Western Criticism. – Cross-listed as Comparative Literature 506A.)
- 503 (3/6) d Problems in the History of the Chinese Language
- 504 (3-18) d Studies in Chinese Palaeography
- 508 (3-18) d Topics in Pre-modern Chinese History and Institutions.
- 509 (3-18) d Aspects of Chinese Popular Thought and Religion
- 511 (3/18) d Readings in Chinese Religious Texts – Selected readings from primary texts in Confucianism, Taoism and Buddhism, and popular religion. Prerequisite: CHIN 301 or equivalent. Same as RELG 511.
- 512 (3-18) d Advanced Readings in Classical Chinese Prerequisite: CHIN 400 or equivalent.
- 513 (3/6) d Topics in Classical Chinese Literature
- 514 (3-18) d Topics in Modern Chinese Literature
- 515 (3-18) d Topics in Early Vernacular Modern Chinese Literature
- 521 (3/6) d Research Methods and Source Materials in Japanese Studies.
- 522 (3/6) d Introduction to kambun kundoku Prerequisite: JAPN 301.
- 523 (3-18) d Topics in the History and Structure of the Japanese Language.
- 528 (3-18) d Problems of Japanese Intellectual History
- 532 (3-18) d Topics in Traditional Japanese Literature
- 533 (3-18) d Topics in Modern Japanese Literature
- 541 (3-18) d Research Methods and Source Materials in South Asian Studies.
- 543 (3-18) d Topics in the History and Structure of Indian Languages.
- 546 (3-18) d Topics in South Asian Literature
- 550 (3-18) d Topics in Early South Asian Civilizations
- 561 (3-18) d Problems of Modernization in Eastern and Southern Asia.
- 570 (3/6) d Approaches to Asian Literature
- 581 (3-18) d Research Methods and Source Materials in Korean Studies.
- 599 (6/12) c Master's Thesis
- 699 Ph.D. Thesis (in Chinese, Japanese, or South Asian Studies only.)

Chinese

- 100 (6) Basic Chinese – An introduction to the grammar and syntax of spoken and written Chinese. (First term.) Normally CHIN 100 and 101 will be taken in the same year. [6-2; 0-0]
- 101 (6) Basic Chinese – Continuation of CHIN 100. (Second term.) [0-0; 6-2]
- 180 (12) Intensive Summer Course in Chinese – Equivalent to CHIN 100 and 101.
- 200 (6) Intermediate Chinese – Further study of the grammar and syntax of modern Chinese. Prerequisite: CHIN 100 and 101, or 180, or equivalent. [3-1; 3-1]
- 201 (6) Intensive Modern Chinese – To be taken in conjunction with CHIN 200. [3-1; 3-1]
- 280 (12) Intensive Summer Course in Intermediate Chinese – Equivalent to CHIN 200 and 201. Prerequisite: CHIN 100 and 101, or 180, or equivalent.
- 300 (6) Advanced Modern Chinese – Modern Chinese with emphasis on readings of contemporary literature and newspapers. Only for students who do not have a good reading knowledge of modern Chinese before entering the University. Prerequisite: CHIN 200. [3-0; 3-0]
- 301 (6) Classical Chinese I – Introduction to Classical Chinese. May be taken in conjunction with CHIN 200 by permission of the Department. Prerequisite: CHIN 100 and 101, or 180, or equivalent. [3-0; 3-0]

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- 302 (6) Advanced Chinese Conversation, Comprehension, and – This course will provide an opportunity for advanced students of Chinese to gain greater mastery over the vernacular language through discussion and analysis of selected topics in Chinese civilization. Prerequisites: CHIN 200 and 201, or equivalent. [3-0; 3-0]
- 305 (6) Readings in Twentieth Century Chinese Literature – For students who have acquired a good reading knowledge of modern Chinese before entering the University. [3-0; 3-0]
- 342 (6) Reading Course in Chinese for Honours students
- 400 (6) Classical Chinese II – More advanced readings in Classical Chinese literary, historical, and philosophical texts. Prerequisite: CHIN 301 or equivalent. [3-0; 3-0]
- 405 (6) Readings in Pre-Modern Chinese Literature – Selected texts from pre-twentieth century drama and fiction. For students who have acquired a good reading knowledge of modern Chinese before entering the University. Prerequisite: CHIN 301 or equivalent. [3-0; 3-0]
- 410 (6) Twentieth-Century Chinese Authors – Selected novels, stories, and poetry. Only for students who do not have a good reading knowledge of modern Chinese before entering the University. Prerequisite: CHIN 300. [3-0; 3-0]
- 411 (6) Pre-modern Chinese Fiction and Drama – Selected passages from thirteenth-century drama and seventeenth- to nineteenth-century fiction. Only for students who do not have a good reading knowledge of modern Chinese before entering the University. Prerequisite: CHIN 301. [3-0; 3-0]
- 413 (6) Readings in Classical Chinese Poetry I – Translation and analysis of selected works, especially from the pre-Han, North-South, and early Tang periods. Prerequisite: CHIN 301 or equivalent. [3-0; 3-0]
- 414 (6) Readings in Classical Chinese Poetry II – Readings in classical poetry from the time of Du Fu (712-770) to the end of the Qing dynasty. Not given every year. Prerequisite: CHIN 301 or equivalent. [3-0; 3-0]
- 425 (6) Readings in Chinese Philosophical Texts – Selected readings from primary texts in the history of Chinese thought exclusive of Buddhism. Not given every year. Prerequisites: CHIN 301 and ASIA 325, or their equivalents. [3-0; 3-0]
- 440 (3-18) c Supervised Study in the Chinese Language – Primarily for graduate students.
- 442 (12) Tutorial in Chinese for Honours Students – This course will require the presentation of at least one research paper.

Japanese**JAPN**

- 100 (6) Intensive Basic Japanese – An outline of the grammar and syntax of the spoken language (together with an introduction to the Japanese script. (First term.) Normally JAPN 100 and 101 will be taken in the same year. [6-2; 0-0]
- 101 (6) Intensive Basic Japanese – Continuation of JAPN 100. (Second term.) [0-0; 6-2]
- 102 (6) Basic Japanese – Equivalent to JAPN 100, but spread out through the year. [3-1; 3-1]
- 103 (6) Basic Japanese – Equivalent to JAPN 101, but spread out through the year. Prerequisite: JAPN 102 or permission of the instructor. [3-1; 3-1]
- 104 (6) Basic Japanese Grammar – Emphasis on grammar, writing and reading. Intended for students with a background in spoken Japanese. [3-1; 3-1]
- 180 (12) Intensive Summer Course in Japanese – Equivalent to JAPN 100 and 101.
- 200 (6) Intermediate Japanese Reading and Writing – Reading and writing of modern colloquial Japanese at an intermediate level. Prerequisite: JAPN 100 and 101, or 102 and 103, or 180, or equivalent. [3-1; 3-1]
- 201 (6) Intermediate Japanese Conversation and Composition – To be taken normally in conjunction with JAPN 200.

Prerequisite: JAPN 100 and 101, or 102 and 103, or 180, or equivalent. [3-1; 3-1]

- 280 (12) Intensive Summer Course in Intermediate Japanese – Equivalent to JAPN 200 and 201. Prerequisite: JAPN 100 and 101, or 102 and 103, or 180, or equivalent.

- 300 (6) Advanced Modern Japanese – Readings in Japanese prose. [3-0; 3-0]

- 302 (6) Advanced Conversation and Composition – Improvement of speaking and writing in modern Japanese through grammatical analysis, oral practice, conversation, and composition. Prerequisite: JAPN 201 or equivalent. [3-0; 3-0]

- 310 (6) Japanese for Specialists of China – Readings in Japanese material dealing with Chinese for students who have a reading knowledge of Chinese. Prerequisites: JAPN 100 and 101, or 102 and 103, or 180, or equivalent; a reading knowledge of Chinese. [3-0; 3-0]

- 311 (3) Classical Japanese I (A) – Instructor's permission necessary.

- 312 (3) Classical Japanese I (B) – Instructor's permission necessary.

- 315 (6) Japanese for Professional Life – Technical Japanese as it is used in business, commerce, industry, science, technology, law, etc. Emphasis on grammatical and syntactical features of these special uses of the language and on specialized, current vocabulary. Prerequisite: JAPN 200 or 201 or 280. [3-0; 3-0]

- 342 (6) Reading Course in Japanese for Honours Students

- 400 (6) Readings in Modern Japanese Prose – Modern essays and criticism; journalistic and scholarly writing. Prerequisite: JAPN 300. [3-0; 3-0]

- 401 (6) Classical Japanese II – Advanced reading in classical Japanese literary, historical, and philosophical texts. Prerequisite: JAPN 300 and 301, or equivalent. [3-0; 3-0]

- 402 (6) Readings in Japanese Poetry – Translation and analysis of selected works from classical, medieval, and modern periods. Prerequisite: JAPN 300 and 301, or equivalent. [3-0; 3-0]

- 416 (6) Newspaper Japanese – The aim of the course will be to develop fluency in reading contemporary Japanese newspapers. Concentration on current and emerging vocabulary, evolving grammatical features, and style of presentation. Not offered every year. Prerequisite: JAPN 300 and 302. [3-0; 3-0]

- 420 (6) Grammatical Analysis of Japanese – Analysis of the grammatical structure of modern Japanese. Contrastive analysis of Japanese and English as well as error analysis. Prerequisites: JAPN 300 and 302. (3-0; 3-0)

- 440 (3-18) c Supervised Study in the Japanese Language – Primarily for graduate students.

- 442 (12) Tutorial in Japanese for Honours Students – This course will require the presentation of at least one research paper.

Korean**KORN**

- 102 (6) Basic Korean – An introduction to the grammar and syntax of modern spoken and written Korean. [3-1; 3-1]

- 200 (6) Intermediate Korean – Reading and writing of modern colloquial Korean at an intermediate level. Prerequisite: KORN 102 or equivalent. [3-1; 3-1]

- 300 (6) Readings in Korean Topics – Readings in mixed script on aspects of Korean culture, customs, and contemporary life, along with structured conversations based on those readings. Prerequisite: KORN 200 or equivalent. [3-0; 3-0]

South Asian Languages**Hindi****HIND**

- 102 (6) Introductory Hindi – An introduction to spoken and written Hindi. [3-1; 3-1]

- 110 (6) Accelerated Hindi – For students with knowledge of another North Indian language before entering the Uni-

versity. Equivalent to HIND 102 and 200. Prerequisite: permission of the instructor. [3-0; 3-0]

- 200 (6) Intermediate Hindi – Further study of the grammar and introduction to the literature of Hindi. Prerequisite: HIND 102 or permission of the instructor. Not open to students who have taken HIND 110. [3-1; 3-1]

- 405 (6) Medieval Hindi – Introduction to medieval Hindi grammar, and readings in medieval poetry (Tulsidas, Surdas, Kabir, etc.). Prerequisite: HIND 200 or 110. [3-0; 3-0]

- 410 (6) Readings in Modern Hindi – Combines a survey of modern Hindi prose and poetry with advanced conversation and composition. Prerequisite: HIND 200 or 110. [3-0; 3-0]

Indonesian**INDO**

- 102 (6) Introductory Indonesian – Spoken and written Indonesian. [3-1; 3-1]

- 200 (6) Intermediate Indonesian – Study of the grammar and introduction to Indonesian literature. Prerequisite: INDO 102 or equivalent. [3-1; 3-1]

Punjabi**PUNJ**

- 102 (6) Introductory Punjabi – Spoken and written Punjabi. [3-1; 3-1]

- 200 (6) Intermediate Punjabi – Study of the grammar and introduction to Punjabi literature. Prerequisite: PUNJ 102 or equivalent. [3-1; 3-1]

Sanskrit**SANS**

- 102 (6) Introductory Sanskrit – Basic vocabulary and most important grammatical features of classical Sanskrit. Useful to students of South Asian history, culture, languages, philosophies, and religions, and of linguistics and classics. [3-0; 3-0]

- 200 (6) Intermediate Sanskrit – Advanced grammar and selected readings. Prerequisite: SANS 102 or equivalent. [3-0; 3-0]

- 300 (6) Further Readings in Sanskrit – Study of selected texts belonging to a particular period (e.g. Vedic) or representing a specific branch of kavya (poetic literature) or sastra (technical-philosophical literature). Prerequisite: SANS 200. [3-0; 3-0]

Urdu**URDU**

- 401 (6) Readings in Urdu – Introduction to Urdu script, and readings in Urdu prose and poetry. Prerequisite: HIND 200 or 110. [3-0; 3-0]

South Asian Languages**SOAL**

- 440 (3-18) c Supervised Study in South Asian Languages

Southeast Asian Languages**SEAL**

- 440 (3-18) c Supervised Study in Southeast Asian Languages

Astronomy**ASTR****DEPARTMENT OF GEOPHYSICS AND ASTRONOMY, FACULTY OF SCIENCE**

See also listings under "Geophysics" and "Geophysics and Astronomy"

- 101 (3) Introductory Astronomy I – Basic astrophysical concepts and observational techniques; recent observations of the Solar System; the Sun and fundamental properties of the stars. Prerequisite: PHYS 11, Mathematics 12. Credit will not be granted for both ASTR 101 and ASTR 200. ASTR 200 is recommended for students who intend to pursue studies in Astronomy. [3-2; 0-0]

- 102 (3) Introductory Astronomy II – An introduction to astronomy following on from Astronomy 101. Topics include stellar evolution; the structure of the Milky Way; properties of Galaxies; the large scale structure of the Universe. Prerequisite: ASTR 101. Credit will not be

- granted for both ASTR 102 and ASTR 200. ASTR 200 is recommended for students who intend to pursue studies in Astronomy. [0-0; 3-2]
- 200 (6) Astronomy – An introduction to many aspects of astronomy, including: the earth, the solar system, stellar structure and evolution; red giant and white dwarf stars, neutron stars, black holes, galaxies, quasars, cosmology and radio astronomy. Prerequisite: PHYS 101, 110, 115 or 120 (or equivalent). [3-0; 3-0]
- 302 (3) Galactic Astronomy – Basic observational data and theoretical interpretation relating to the structure of our galaxy. Topics include the galactic distance scale, the distribution and kinematics of the stars and gas in the galaxy, star clusters and stellar populations. Prerequisites: Six credits of physics at the 200-level or above or permission of Head of Department. ASTR 200 is recommended. [3-0]
- 305 (5) Extragalactic Astronomy – A topics course emphasizing basic physical processes which determine the observed characteristics of external galaxies, including radio galaxies and other active systems. Clusters of galaxies and the large scale structure of the universe will be discussed. Prerequisite: Six credits of physics at the 200 level or above or permission of the Head of the Department. ASTR 200 is recommended. [3-0]
- 401 (3) Stellar Astrophysics – Physical principles determining the structure and evolution of stars including the sun. This will include nuclear reactions, radiative transfer and the state of matter in stars. Prerequisite: PHYS 203. [3-0]
- 402 (3) Non-Stellar Astrophysics – A topics course which will discuss physical processes relating primarily to diffuse matter in space. The topics will include the interstellar medium, gaseous nebulae and both thermal and non-thermal radiation processes in our own and external galaxies. Prerequisite or corequisite: PHYS 203, 301. [3-0]
- 421 (4) Astronomical and Astrophysical Measurements – Astronomical instrumentation for satellite and ground-based optical and radio observations, theory of measurement of stellar spectra and radiative flux and applications to understanding stellar masses, temperatures, magnetic fields, galactic structure, and interstellar material. Prerequisites: PHYS 308 or equivalent, MATH 315 or equivalent (concurrently). [2-0; 2-0]
- 451 (2) Astronomical Laboratory – Experiments in the use of basic measuring instruments, study of stellar spectra, photometric records, star charts, use of 40 cm reflector for observations. Prerequisite: ASTR 421 (concurrently). [0-3; 0-5]
- 449 (2-6) c Directed Research in Astronomy – The student will investigate a research problem under the direction of a staff member. (If elected for 6 credits, a thesis will be required.)
- 500 (6) Principles of Modern Astronomy – An introduction to the physical processes occurring in the stars, the interstellar medium, and in our own and other galaxies. (Fourth-year honours students may elect this course with special permission of the Head of the Department.) Prerequisites: fourth year physics honours program, or permission of the Head of the Department.
- 503 (2-6) c Observational Astronomy – Critical discussion of modern ground-based and satellite borne instrumentation for astronomical observations in all spectral regions. Description of measuring engines and reduction techniques.
- 504 (2-6) c Stellar Astronomy – The study of the structure of stellar interiors and stellar atmospheres and the physical processes occurring in them: the interpretation of stellar spectra; nucleosynthesis, and related problems.
- 505 (2-6) c Galactic Astronomy – The study of the structure, content and evolution of our own and other galaxies, including the study of the physical processes occurring in the interstellar medium and galactic nuclei.
- 530 (2-6) c Directed Studies in Astronomy
- 534 (2-6) c Studies in Stellar Structure
- 535 (2-6) c Studies in Stellar Atmospheres
- 536 (2-6) c Studies of the Interstellar Medium
- 537 (2-6) c Studies in Extra Galactic Astronomy
- 538 (2-6) c Studies in Cosmology
- 549 (12) M.Sc. Thesis
- 649 Ph.D. Thesis
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- Atmospheric Science** **ATSC**
FACULTY OF SCIENCE
- 200 (3) Macroscale Weather and Climate I – An introduction to the principles of meteorology and climatology at the synoptic and global scales. Atmospheric energy, moisture and motion. Weather systems, forecasting and global climates. Prerequisites: GEOG 101 or 102 or the first year of a B.Sc. program. (Same as GEOG 200.) [3-2; 0-0]
- 300 (3) Weather and Climate II – An introduction to the principles of meteorology and climatology at the micro-, local, and meso-scales. Transfers and balances of heat, mass and momentum. Microclimates on scales of a leaf to those of a large valley. Credit for only one of ATSC 300, GEOG 204, 300 or SOIL 204. Prerequisites: ATSC 200 or GEOG 200. (Same as GEOG 300.) Credit will be given for only one of ATSC 300, GEOG 204, 300 or SOIL 204. [0-0; 3-0]
- 301 (3) Atmospheric Energetics – Atmospheric thermodynamics and radiative transfer. Enthalpy and entropy; static stability, mixing and thermodynamic diagrams; absorption and transmission of long and shortwave radiation. Prerequisite: one of PHYS 156, 203, 213, GEOP 230. (Same as GEOG 301.) [3-0-2; 0-0-0]
- 302 (3) Atmospheric Phenomena – Physical basis of cloud, precipitation and other atmospheric phenomena. Cloud dynamics and microphysics; aerosol, droplet, ice particle growth and cloud electrification; global entropy budgets; radar meteorology. Prerequisite: ATSC/GEOG 301 (Same as GEOG 302.) [0-0; 3-0]
- 303 (3) Methods in Atmospheric Science – An introduction to instrumentation used in monitoring the state of the atmosphere; a brief survey of methods of analysis of meteorological data. Prerequisite: ATSC/GEOG 200; CPSC 111 or 122. (Same as GEOG 303.) [0-0; 2-2]
- 411 (3) Atmospheric Dynamics – Applications of dynamical principles to motions in the atmosphere. Topics include the planetary boundary layer, synoptic-scale motions, cyclogenesis and the general circulation and numerical weather prediction. Prerequisite: PHYS 312 or MATH 316, and ATSC/GEOG 301. (Same as OCGY 411.) [0-0; 3-0]
- 414 (3) Geophysical Fluid Dynamics – The fundamental principles governing the flow of a density-stratified fluid on a rotating planet, with applications to the motions of the ocean and the atmosphere. Prerequisite: PHYS 312 or MATH 316. (Same as OCGY 414.) [3-0; 0-0]
- 440 (3) Synoptic Meteorology – Introduction to meteorological analysis. Diagnosis of weather systems including their motion and development. Observing systems and chart analysis, cross-sectional and diagnostic analysis of synoptic systems. Emphasis on practical tutorial-laboratory exercises. Prerequisite: ATSC/GEOG 200 and 300. (Credit may not be obtained for both this course and GEOG 302 prior to September 1988.) [1-3; 0-0]
- 441 (3) Contemporary Developments in Synoptic Meteorology – Satellite and computer aided analysis and prognosis of synoptic systems. Prognosis of weather systems including their motion and development. Objective analysis, numerical weather prediction, forecasting techniques and forecast verification. Emphasis on practical laboratory exercises. Prerequisite: ATSC 440. [0-0; 1-3]
- 442 (3) Weather Seminar – Analysis and discussion of the synoptic and local weather for the preceding and forthcoming weeks using surface and upper air charts and satellite imagery. Prerequisite: ATSC 440 (Credit may not
- be obtained for both this course and GEOG 303 prior to September, 1988.) [0-0-0; 0-2-1]
- 449 (6) Honours Project – Honours students must submit a graduating report based on a project undertaken with the approval of the Chairperson of the Atmospheric Science Program.
- 599 (12) Master's Thesis
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- Audiology and Speech Sciences AUDI**
SCHOOL OF AUDIOLOGY AND SPEECH SCIENCES,
FACULTY OF MEDICINE
- All 600-level seminars are Ph.D. level courses and may not be offered on a regular basis. All may be taken more than once for credit.
- 400 (3) Introduction to Speech-Language Pathology and Audiology. – Frameworks from linguistics, psychology, and speech and hearing sciences as applied to communication disorders, clinical populations and practices. Prerequisite: LING 200. (3-0; 0-0)
- 402 (3) Introduction to Neurolinguistics – Principles governing the understanding of the relationship between brain and language; brain organization, including lateralization and localization; levels of language disturbance. Prerequisites: LING 300, 310. [0-0; 3-0]
- 501 (4) Instrumental Phonetics – Study of instrumental methods in speech research, in particular, sound spectrography, speech analysis and synthesis. Lectures, demonstrations and laboratory work. [4-2; 0-0]
- 503 (4) Auditory Functions - Selected Topics – Critical study of current theories of hearing, psychoacoustics, recent advances in bioacoustics. [2-0; 2-0]
- 506 (3) Speech Perception – Critical review and analysis of current theories and research in speech perception, including motor theory, analysis by synthesis, and categorical perception in relation to infant, adult and animal data. [3-0; 0-0]
- 513 (3) Acoustic Phonetics – Concepts of acoustics in their practical application to speech, voice and hearing problems, in both normal and pathological situations: the source-filter theory. Prerequisites: LING 315, Math 101. [3-0; 0-0]
- 514 (3) Auditory Mechanisms I. – The normal hearing process, including auditory physiology and psychoacoustics. Prerequisites: MATH 101. Recommended: PSYC 313. [3-0; 0-0]
- 516 (3) Discourse Analysis – Speech act theory and description; frameworks for describing discourse genres, structures and organization; overview of discourse development and disorders. Prerequisite: LING 350. [0-0; 3-0]
- 518 (3) Fundamentals of Audiology – Causes, identification and assessment of hearing impairment; hearing screening, basic audiologic test procedures, interpretation of results, and rehabilitation options. Lab and observations. Prerequisites or corequisites: AUDI 513, 514, 522. Open only to students enrolled in the School. [2-2; 0-0]
- 520 (3) Developmental Phonetics and Phonology – Theories of speech sound development, with emphasis on English: analysis of methodology and research techniques: phonetic transcription. Lab. Prerequisites: LING 310, 315, 400. Recommended: LING 401. [2-2; 0-0]
- 522 (3) Communication Disorders: Assessment and Intervention. – Principles for identifying, screening, evaluating and treating individuals with speech, language and hearing disorders; standardized and non-standardized measures, case history interviewing, development of assessment and treatment plans, and report writing. Lab and observations. Open only to students enrolled in the School. [2-2; 0-0]
- 523 (3) Experimental Phonetics – Acoustic phonetic and acoustic prosodic features observed in speech analysis, particularly in spectrographic displays, and their relation to production and perception: experimental findings and

- theories pertaining to the most important of these features. Prerequisite: AUDI 513. [0-0; 3-0]
- 526 (3) Acquired Language Disorders – Language impairment resulting from acquired brain damage; aphasia and head injury; assessment, interpretation of results, intervention planning and procedures, family/client counselling. Lab. Prerequisites or corequisites: AUDI 402, 522. [2-2; 0-0]
- 528 (3) Aural Rehabilitation: Principles and Practice – Current approaches to assessment and rehabilitation of communication problems arising from hearing impairment. Lab. Prerequisite: AUDI 518. [2-2; 0-0]
- 530 (2) Research Methods – Procedures suitable for speech-language pathology, audiology, and speech, language and hearing sciences; includes experimental, quasi-experimental and descriptive paradigms; single-subject and group analyses; culminates in research proposal. [0-0; 2-0]
- 545 (0) Issues in Clinical Practice – Ethics, service delivery systems, practice considerations specific to the work place.
- 546 (1-9) d Seminar in Audiology and Speech-Language Sciences – May be taken for credit more than once.
- 547 (1-9) c Directed Reading in Audiology and Speech Sciences – May be taken more than once.
- 548 (3) Graduating Paper.
- 549 (6) M.Sc. Thesis
- 552 (3) Audiologic Assessment I – Principles and procedures of audiometric testing and calibration; emphasis on basic audiologic and pediatric test procedures. Lab. Prerequisites: AUDI 518, 522. [2-2; 0-0]
- 554 (3) Auditory Mechanisms II – Advanced treatment of the mechanisms of the auditory system; combines auditory physiology and psychoacoustics. Prerequisite: AUDI 514. [0-0; 3-0]
- 556 (3) Aural Rehabilitation: Instrumentation – Use of hearing instruments in an aural rehabilitation program, including selection and evaluation. Lab. Prerequisite: AUDI 518, 522. [0-0; 2-2]
- 558 (3) Physiological Measurement of Auditory Function – Principles and procedures of physiological measures of auditory function, including evoked potentials and acoustic immittance. Lab. Prerequisites: AUDI 552. [2-2; 0-0]
- 559 (2) Practicum in Speech-Language Pathology for Audiology Majors. Prerequisites: AUDI 522, 526. Open only to students enrolled in the School. [Summer]
- 560 (3) Audiologic Assessment II – Principles and procedures of special audiologic tests; integration of etiologies of hearing loss, effects on the auditory system and audiologic test battery. Lab. Prerequisites: AUDI 552, 554. Pre- or corequisite: AUDI 558. [2-2; 0-0]
- 562 (2) Childhood Hearing Disorders – Advanced pediatric assessment and management; etiology of childhood hearing loss; speech and language of children with hearing impairment. Prerequisites: AUDI 520, 552, LING 350. [2-0; 0-0]
- 564 (3) Advanced Hearing Science – Consideration of critical bodies of data, current theories, and recent advances in auditory physiology and psychoacoustics. Prerequisite: AUDI 554. [3-0; 0-0]
- 567 (2-8) d Topics in Audiology and Hearing Science – May be taken more than once for credit.
- 568 (3/6) d Audiology Practicum I Prerequisites: AUDI 518, 552, 554, 556. [Summer]
- 569 (3) Audiology Practicum II Prerequisites: AUDI 528, 558, 560, 568, and either 562 or 564. [0-0; 0-6]
- 570 (3) Phonological and Phonetic Disorders – Nature, identification, assessment and treatment of disorders of phonology and phonetics; includes cleft lip and palate and other orofacial anomalies; assessment methodology and case management planning. Lab. Prerequisites: AUDI 520, 522 [0-0; 2-2]
- 571 (3) Developmental Language Disorders – Nature of such disorders, principled strategies for assessment and intervention; language sample analysis, and critique of current approaches to language intervention. Prerequisites: LING 350, PSYC 301. Recommended: PSYC 309, 336, 337. [0-0; 2-2]
- 572 (3) Linguistic Aphasiology – History of linguistic aphasiology; analysis of current research in disturbances of the sound system, sentence production and sentence comprehension; relationships between the various levels of language disturbance in aphasia. Prerequisites: LING 310, 300, 400, AUDI 402. Recommended: LING 301, 401. [3-0; 0-0]
- 575 (3) Language Development and Disorders in the School Years. – Demands on the language of school age children; classroom discourse; language and curriculum content; bilingualism and cultural diversity; description, identification, and management of language disorders related to academic performance. Prerequisites: LING 350, AUDI 516. [3-0; 0-0]
- 576 (3) Disorders of Speech Production – Identification, assessment and treatment of individuals with voice, fluency or motor speech disorders; includes disorders in adults and children, and principles of augmentative/alternative communication. Lab. Prerequisites: LING 315, AUDI 522. [0-0; 2-2]
- 579 (2) Practicum in Audiology for Speech-Language Pathology Majors. Prerequisites: AUDI 518, 522. Open only to students enrolled in the School. [Summer]
- 580 (2) Developmental Speech Perception – Auditory, phonetic and developmental theories of the perception of speech and nonspeech signals; examination of data, methodologies and research techniques. Lab. Prerequisites: AUDI 513, 520, 523. [0-0; 2-0]
- 581 (3) Communication: Special Populations – Acquisition and use of speech and language by people with lifetime challenges, including hearing or visual impairment, mental retardation, autism; management of concomitant communication disorders. Prerequisites: LING 350, PSYC 301, AUDI 520. Recommended: AUDI 522, 571. [3-0; 0-0]
- 583 (3) Advanced Speech Science – Theories and models of speech production, with particular emphasis on coarticulation, timing control, invariance and motor equivalence. Prerequisite: AUDI 523. [3-0; 0-0]
- 585 (2) Determinants of Language Development – Critical examination of current theories of language acquisition; implications for research and clinical practice. Prerequisite: LING 350. [0-0; 2-0]
- 586 (3) Acquired Speech and Language Disorders – Treatment of aphasic, head-injured and/or dysarthric individuals; current approaches to intervention, their efficacy and practical application. Prerequisites: AUDI 526, 576, 588. Corequisite: AUDI 572. [3-0; 0-0]
- 587 (2-8) d Topics in Speech-Language Sciences – May be taken more than once for credit.
- 588 (3/6) d Speech-Language Pathology Practicum I Prerequisites: AUDI 518, 552, 554, 556. [Summer]
- 589 (3) Speech-Language Pathology Practicum II Prerequisites: AUDI 588 and five of the following: 528, 572, 575, 581, 583, 586. [0-0; 0-6]
- 598 (2) Fundamentals of Audiology for Health and Education – Same as AUDI 518, except does not include lab or observations. Cannot be taken for credit by students enrolled in the Audiology and Speech Sciences M.Sc. program. [2-0; 0-0]
- 649 (6) Ph.D. Thesis
- 660 (1-9) d Seminar in Hearing Science
- 670 (1-9) d Seminar in Developmental Phonetics and Phonology – Examination of current research, roles of theories in understanding the relationship between speech sound production and comprehension/perception. Prerequisite: AUDI 580.
- 672 (1-9) d Seminar in Linguistic Aphasiology – Examination of current research, roles of linguistic theories in understanding language disturbance in aphasia; development of single-case studies. Prerequisite: AUDI 572.
- 675 (1-9) d Seminar in Developmental Language Disorders
- 685 (1-9) d Seminar in Language Development
- 690 (1-9) d Seminar in Speech Science

Biochemistry **BIOC**
DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR
BIOLOGY, FACULTY OF MEDICINE

- 300 (6) Principles of Biochemistry – An introduction to proteins and enzymes, the major metabolic pathways and control mechanisms and the biochemistry of gene function, with an emphasis on human biochemistry. Prerequisite: CHEM 230 or 213 or 203. (Students are advised not to take this course unless their standing in the prerequisite is at least 60%). This course is equivalent to BIOC 201 plus BIOC 302. [3-0; 3-0]
- 301 (3) Biochemistry Laboratory – Techniques by which the chemical and physical properties of fundamental components of the cell are studied. BIOC 300, 302, or 303 must precede or be taken concurrently with this course. [0-3-1; 0-3-1]
- 302 (3) General Biochemistry – Metabolic reactions of lipids, steroids, amino acids and nucleotides; the biochemistry of replication, transcription and translation. Prerequisites: CHEM 230 or 213 or 203 and BIOC 201.
- 303 (6) Molecular Biochemistry – Structure, function and metabolism of lipids, steroids, amino acids and nucleotides; the biochemistry and molecular biology of replication, transcription, translation and gene regulation. For Majors and Honours students in Biochemistry and Honours students in other life science programs. Prerequisite: CHEM 230 or 213 or 203 and BIOC 201. [3-0; 3-0]
- 400 (6) Human Biochemistry – Medical aspects of metabolism, molecular biology; biochemical properties of specialized tissues. Prerequisites: BIOC 300 or BIOC 201 plus BIOC 302 or 303 and CHEM 230 or 213 or 203. Restricted to students in the Faculty of Medicine and others with permission of the Department Head.
- 402 (3) Proteins: Structure and Function – Structural components of proteins, classification by primary, secondary and tertiary structure, protein chemistry and purification, peptide and protein synthesis by chemical means and three-dimensional structure determination using X-ray diffraction and NMR. Prerequisite: BIOC 300, 302 or 303 in which at least a 65% standing is recommended. [3-0; 0-0]
- 403 (3) Enzymology – Kinetic analysis, catalytic mechanisms, transition state stabilization and regulation of activity, strategies for active site characterization and case studies of well-documented enzyme systems. Prerequisite: BIOC 402, in which at least a 65% standing is recommended [0-0; 3-0]
- 404 (3) Biochemical Methods – The theory and application of techniques used to address biochemical problems. Restricted to Honours students in biochemistry or others with permission of the Instructor. [1-0; 2-0]
- 410 (3) Nucleic Acids – Structure and Function – Chemical, physical and biological properties of nucleic acids and their role in replication, transcription, translation and regulation of expression of genetic material. Credit will not be given for both BIOC 410 and 510. Prerequisite: BIOC 303 and BIOC 335. Students who obtain less than 65% in either prerequisite are strongly discouraged from registering in BIOC 410. [3-0; 0-0]
- 420 (3) Advanced Biochemical Techniques – Practical experience in experiments involving cell fractionation, protein purification, spectrophotometry, electrophoresis, chromatography, and ultracentrifugation. Restricted to Honours students in Biochemistry and others with permission of the Instructor. Corequisite: BIOC 404. [0-0; 0-0]

- 421 (3) Recombinant DNA Techniques – Practical experience in experiments involving transposon mutagenesis, restriction enzyme mapping, DNA sequencing and use of monoclonal antibodies. Restricted to Honours students in Biochemistry and others with permission of the Instructor. Prerequisite: BIOC 410. [0-0; 0-6]
- 448 (3/6) c Directed Studies in Biochemistry – A library (3 credits) or a laboratory project with written report (three or six credits) allowing a student to undertake an investigation on a specific topic as agreed upon by the faculty and student. Permission of the Department Head is required.
- 449 (3/6) c Honours Thesis – A research problem under the direction of a faculty member. Restricted to Honours students.
- 501 (2-6) c Advanced Biochemistry Laboratory – Practical applications of advanced biochemical techniques. BIOC 404 or its equivalent is required concurrently. Admission is limited and is by permission of the Head of the Department.
- 503 (2) Molecular Biochemistry – A lecture course in molecular biology: replication, transcription, translation, gene organization, gene expression. Credit will not be given for both BIOC 303 and 503. [0-0; 3-0]
- 509 (4) Biochemistry of Membranes – Lectures and discussions on the biochemistry of membrane lipids and proteins, the structure and assembly of membranes, the respiratory chain and electron transport, photophosphorylation and transport across membranes. Given in alternate years.
- 510 (3) Nucleic Acids: Structure and Function – Structure and function of nucleic acids and their role in replication, transcription, translation and expression of genetic information. Credit will not be given for both BIOC 410 and 510. Prerequisite: BIOC 303 or permission of Instructor. [3-0; 0-0]
- 511 (3) Biochemical Aspects of Cellular Regulation – A lecture and discussion course on the molecular basis of cellular regulation with special emphasis on mammalian cells. Mechanisms involved in the responses of cells to adrenergic, steroid and peptide hormones and growth factors. Regulation of the concentration and specific activity of key enzymes, transport systems and structural proteins. Given in alternate years.
- 514 (3) Advanced Topics in Protein Chemistry – Topics will include contemporary theoretical and experimental investigation of protein structure-function relationships. Topics will vary. [0-0; 3-0]
- 521 (3) Advanced Topics in Molecular Biology – Discussions based on topics in the current literature. Prerequisite: BIOC 410 or 510. [0-0; 3-0]
- 530 (3) Seminar in Biochemistry – Attendance is required of all graduate students in Biochemistry. Normally students will present one paper on a topic approved by their research adviser or committee or on the results of their research.
- 548 (2-6) c Directed Studies – In special cases, with approval of the Head of the Department, advanced courses may be arranged for graduate students in attendance.
- 549 (12) M.Sc. Thesis
- 649 Ph.D. Thesis
- 349 (3) Principles of Energy Use in Agriculture – Sources, flow requirements, substitutions and conservation of energy in relation to operations for farm mechanization, farm structures, feed and food processing, waste management, aquaculture and water management. (For non-engineering students.) [3-2-0; 0-0-0]
- 258 (3) Principles of Energy Use in Agriculture – Sources, flow requirements, substitutions and conservation of energy in relation to operations for farm mechanization, farm structures, feed and food processing, waste management, aquaculture and water management. (For non-engineering students.) [3-2-0; 0-0-0]
- 285 (3) Introduction to Bio-Resource Engineering Systems Analysis. – The tools of systems analysis with selected applications to the primary renewable resource production enterprises. Emphasis in presentation of written and oral reports. [0-0-0; 2-0-2]
- 300 (3) Principles of Food Engineering (2) – Units and dimensions, mass balance, steady state and transient heat flow, thermodynamics, fluid flow, fluid handling and measurement (For non-engineering students.) [2-2-0; 0-0-0]
- 303 (3) Introduction to Feed Technology – Introduction to unit operations of feed technology. Physical and nutritional properties of feed and ingredients in relation to processing. Unit operations: size reduction (grinding, rolling), mechanical sorting, sifting and separation, mixing of solids, pelletizing and cubing, weighing and metering, cooling and drying. Conveying, handling and transportation systems. Process evaluation and quality control. Same as ANSC 303. [2-2*-2*; 0-0-0]
- 306 (3) Functional Design of Aquacultural Operations – Aquaculture and its justification. Functional specifications for performance, reliability and economy for aquacultural production operations. Site selection, water quality criteria and physical and biological considerations of plant and animal species. Not restricted to Applied Science students. [2-2*-2*; 0-0-0]
- 355 (3) Physical Properties of Plant and Animal Materials – Structure; physical characteristics, mechanical, rheological, thermal, optical and electrical properties of agricultural products. Applications to harvesting, processing, storage and quality evaluation. [0-0-0; 2-2*-2*]
- 356 (3) Principles and Engineering Applications of Plant and Animal Physiology. – Applications of the physiological principles of energy, water and nutrient acquisition and regulation in living organisms. Heat and mass balance analysis and productivity concepts. Engineering modifications and design of environments to optimize growth of selected organisms. [0-0-0; 2-2*-2*]
- 360 (3) Irrigation and Drainage – Soil-water-crop relationships, different methods of irrigation and drainage. (For non-engineering students.) [2-2-0; 0-0-0]
- 361 (3) Soil and Water Engineering – An introduction to the fundamental principles governing the planning and design of irrigation and drainage systems. Examination of interrelations between drainage-irrigation and soil-water-crop systems. [0-0-0; 2-2*-2*]
- 376 (3) Applications of Heat, Mass and Momentum Transfer – Applications in controlled environments, food processing and waste treatment. Thermal design for biological systems. Mathematical modelling and computer simulation techniques. Prerequisite: CHML 351. [0-0-0; 2-0-2]
- 390 (3) Biological Waste Systems Design and Management – Analysis and design of treatment systems with emphasis on wastes from the food production and processing industries. Waste characterization, biological kinetics, attached and suspended growth systems, land application. [2-2*-2*; 0-0-0]
- 403 (3) Advanced Feed Technology – Handling, conveying and storage systems. Liquid feed processing and handling. Flow characteristics in bins and flow through orifices. Extrusion operation and systems. Process flow design. Feed plant layout and automation. Systems integration. Dust control filtering and exhausting systems. Explosion and fire prevention. [0-0-0; 2-2*-2*]
- 456 (3) Design of Closed Environments – Dynamic energy balances, natural and forced ventilation design, solar radiation control and utilization. Greenhouse heating and cooling using conventional and alternate energy sources. Control systems and lighting design. Prerequisites: BIOC 366 and BIOC 376. [2-0-2; 0-0-0]
- 464 (3) Irrigation and Drainage Engineering – Drainage and irrigation design criteria development; design of drainage and irrigation systems; computer aided design and drafting; construction and maintenance of water management systems. Prerequisites: BIOC 361, CHML 251. [0-0-0; 2-2*-2*]
- 471 (3) Systems Design I – Application of fundamental principles used in engineering design and development of soil-machine systems and bio-material machine systems with primary production case studies from agriculture, aquaculture, and silviculture. Emphasis on individual initiative and application of fundamentals. Term design project. Prerequisite: BIOC 285. [2-2*-2*; 0-0-0]
- 472 (3) Materials Handling Methods – Design and selection of materials handling equipment and devices useful for the secondary production systems for handling, processing and storage of food, feed, and fibre. Emphasis on individual initiative and application of fundamentals. Term design project. Prerequisites: BIOC 285, BIOC 471. [0-0-0; 2-2*-2*]
- 480 (3) Food Process Engineering – A study of the unit operations pertaining to processing of food and agricultural materials. Cleaning, sorting, grading, size reduction, heating, cooling, freezing, drying and storage. Prerequisite: BIOC 376. [2-0-2; 0-0-0]
- 481 (3) Food Engineering – Heating, cooling and freezing of food materials. Heat exchange devices. Diffusional operations, physical separations. Storage stability. Prerequisite: BIOC 480. [0-0-0; 2-0-2]
- 485 (3) Aquacultural Engineering – Study of the functional and technical aspects of aquacultural primary production systems for plant and animal species in fresh and in marine waters. Consideration of the inter-relationships between the characteristics of the species and the facilities, equipment and environment with the view of evolving a comprehensive production system. Prerequisite: BIOC 306. [0-0-0; 2-0-2]
- 489 (2) Seminar – Papers, and discussions on recent bio-resource engineering developments. [0-0-2*; 0-0-2*]
- 490 (3) Advanced Biological Waste Systems Design and Management. – Microbial growth kinetics in mixed systems. Analysis and design aspects of biological reactors. Processes of diffusion, advection, dispersion, and sorption. Chromatography and fixed-film reactors. Design and management of land application systems. Prerequisite: BIOC 390 or equivalent. [0-0-0; 2-0-2]
- 498 (2-6) c Directed Studies – Requires approval of the Department Head.
- 499 (6) Thesis – Research or design problem under the direction of a staff member. [0-2-0; 0-4-0]
- 540 (3) Design of Aquacultural Systems – System analysis as a design process applied to intensive and extensive aquacultural multitrophic level fish and plant production processes in salt and/or fresh waters.
- 549 (12) Master's Thesis – For M.Sc. degree.
- 554 (3) Instrumentation for Biomaterial Research – Instruments, theory, applications, methods and standards for measuring and recording temperature, flow, pressure, humidity, time, colour, force, deformation and length. Application to problems in biomaterial research and food engineering. The purpose of this course is to familiarize the student with methods, techniques and problems of measurement.
- 555 (3) Load Response of Biomaterials – The response of biomaterials subjected to static, quasi-static, cyclic and impact loading conditions. Viscoelastic models of biological materials. The relationship between tissue structure and tissue response. Cellular models.

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- 250 (3) Biosystems for Engineers – Basic concepts of biosystems and how their relations to engineering. The structure and properties of biosystems at the biochemical, cellular, and organizational levels, with emphasis on their relevance to the solution of engineering problems. [2-0-2; 0-0-0]
- 251 (3) Biological Systems Engineering – Concepts of biosystems and their relations to engineering. The structure and properties of biological populations and commu-

- 560 (3) Small Watershed Systems Design – Hydrologic design of water management systems for the production of agricultural and other biological materials. Analysis and design of composite systems for watersheds.
- 561 (3) Advanced Drainage – Theory of land drainage; horizontal and vertical drainage; hydrologic characteristics of drainage systems; drainage requirements of crop; salinity control.
- 562 (3) Advanced Irrigation – Land preparation; irrigation planning and design; water supplies and control; crop growth and water quality.
- 563 (3) Quality of Water Supplies – Criteria of water quality related to its use. Factors affecting water quality due to desirable and undesirable processes.
- 565 (2) Environmental Control for Food Resource Planning – Thermal, psychrometric and illumination control in food resource systems. Special problems associated with high population densities in plant and animal confined housing.
- 566 (2) Design of Food Production Systems – Labour efficiency, material flow, economic criteria, control of natural hazards.
- 571 (2) Bio-Machine Systems – Theoretical analyses of unit operations performed by various agricultural and processing machines. Consideration of the interaction between machine parameters and biological parameters.
- 572 (3) Soil-Machine Systems – Soil dynamics as applied to tillage and traction. The effect of tillage on soil parameters. Tillage design to create an optimum environment for plant growth.
- 580 (2) Engineering Principles Applied to Food Concentration. – Thermodynamics of water sorption and desorption. Permeability and diffusion of vapours and gases through tissues and protected interfaces. Moisture migration, capillary, slip and molecular flow.
- 583 (2) Viscous Properties of Foods – Pseudoplastic, dilatant, thixotropic and rheopectic properties of foods. Model systems, food texture.
- 584 (2) Thermal Properties of Plant and Animal Products – Methods of measurement of enthalpy, specific heat, thermal diffusivity. Steady state and transient heating, cooling and freezing. Kinetics of thermal processing.
- 590 (2-4) c Waste Treatment in Agricultural and Food Industries. – Design and evaluation of current agricultural and food processing waste management practice. Effect of physical properties, environmental factors and pollution potential on treatment methodology.
- 597 (2-6) c Topics in Bio-Resource Engineering – Lectures and special topics in the field of Bio-Resource Engineering may be arranged upon approval of the Head of the Department.
- 598 (2) Seminar – Presentation and discussion of current topics in Bio-Resource Engineering research.
- 599 (6-12) c Thesis – For M.A.Sc. degree.
- *Primarily for First-Year Students BIOL 120 is a prerequisite for admission to Major or Honours options in the Biology Program. Students who receive a grade of at least 80% in Biology 12 are encouraged to enter BIOL 120 directly. Other students will need to take either BIOL 110 or 115 prior to registering in BIOL 120. The course selected is determined by the level of biology completed in high school as noted under course description. Students interested in meeting the entrance requirements of the Faculties, or Schools, of Agricultural Sciences, Dentistry, Forestry, Family and Nutritional Sciences, Medicine, Pharmaceutical Sciences, Human Kinesiology, and Rehabilitation Medicine should consult the appropriate office to determine the first-year Biology requirement.
- 110 (3) Cellular and Organismal Biology – Structure and functioning of cells and multicellular organisms. Lab includes local field trips. Not open to students who have credit for Biology 12. Credit may be obtained for only one of BIOL 110 or 115. [3-2-5-0]
- 115 (3) Organismal Biology – Structure and functioning of organisms in their habitats. Lab includes local field trips. Prerequisite: Biology 12. Credit may be obtained for only one of BIOL 115 or 110. [3-2-5-0]
- 120 (3) Ecology, Genetics and Evolution – Ecological relationships in populations, mechanism of inheritance, evidence for and mechanisms of evolution. Prerequisite: 80% in Biology 12 or completion of BIOL 110 or 115. [3-2-5-0]
- 153 (6) Human Biology – The principles of biology with particular reference to the human body. Laboratories will include an examination of fundamental tissues and selected experiments on organ physiology. Open only to students in the School of Nursing. BIOL 120 is not a prerequisite. [3-3-0]
- 200 (3) Cell Biology I: Structural Basis – Structure and function of plant and animal cells; membrane models, cytoplasmic organelles, biological information from gene to protein, the endomembrane system, secretion, intracellular digestion, endocytosis, transport processes, cytoskeleton and cell motility. Prerequisite: BIOL 120. [3-3-0]
- 201 (3) Cell Biology II: Introduction to Biochemistry – Biological micro- and macromolecules, protein structure and enzyme action, energy transfer, selected metabolic sequences and their regulation. Prerequisite: BIOL 200. Corequisite: CHEM 230, 213 or 203. Credit given for only one of BIOL 201 or BIOC 300. [3-0-2]
- 204 (3) Comparative Vertebrate Zoology – Introduction to the vertebrate phyla and their evolution; a comparative study of vertebrate structure and function, with dissection of representative forms. Prerequisite: BIOL 120. [3-3-0]
- 205** (3) Comparative Invertebrate Zoology – An introduction to the invertebrate phyla. Prerequisite: BIOL 120. [3-3-0]
- 209 (3) Non-Vascular Plants – A study of fungi, algae, lichens and bryophytes, integrating form and function as they are related to adaptation to environment. Prerequisite: BIOL 120. [3-3-0]
- 210 (3) Vascular Plants – A comparative study of pteridophytes, gymnosperms and angiosperms, integrating form, function and ecology. Prerequisite: BIOL 120. [3-3-0]
- 300 (3) Biometrics – Statistical procedures for biological research; estimation, hypothesis testing, goodness of fit, analysis of variance and regression; use of computers for statistical analysis. Prerequisite: BIOL 120, MATH 101 and third year standing. Credit given for only one of BIOL 300 or PLNT 321. [3-2-0]
- 301 (3) Biomathematics – Introduction to uses of mathematics in the biological sciences; experimental design and modelling of biological processes. Prerequisite: BIOL 300. Credit given for only one of BIOL 301, PLNT 322, FRST 430, or STAT 305. [3-0-0]
- 302 (3) Community and Ecosystem Biology – Introduction to the principles of ecology at the community and ecosystem levels of integration. Topics include community structure and dynamics, productivity, decomposition, and mineral cycling. Prerequisite: BIOL 120; BIOL 305 is strongly recommended. [3-0-1*]
- 303 (3) Population Biology – Introduction to the study of plant and animal populations and their physical and biological environments. Topics include natural selection and microevolution, demography, population dynamics, competition and predation. Prerequisite: BIOL 120. [3-0-1*]
- 305 (3) Introduction to Biological and Geological Oceanography – Organisms in the sea and their relation to the physical and chemical environment; marine sediments and their relationships to biological and physical processes. This course is the same as OCGY 309. Prerequisite: OCGY 308 is recommended.
- 310 (3) Introduction to Animal Behaviour – The ethological approach to the study of animal behaviour: social behaviour, physiological mechanisms underlying behaviour. Students are expected to carry out a short project in the laboratory or field (see also BIOL 410). Prerequisite: BIOL 120 and 3rd year standing. [3-0-2]
- 320 (3) Survey of Algae – A survey of the algae, considering their morphology, life history, classification, and ecology. Prerequisite: BIOL 120. [3-3-0]
- 321 (3) Structure and Evolution of the Bryophyta – A study of evolution, taxonomy and morphology of mosses, liverworts and hornworts with emphasis on living plants in their environment. Prerequisite: BIOL 120. [2-4-0]
- 322 (3) Structure and Evolution of Ferns and Fern-allies – Anatomy, morphology and relationships of the ferns and fern-allies, with assessment of both fossil and extant taxa. Prerequisite: BIOL 120. [2-4-0]
- 323 (3) Structure and Reproduction of Fungi – The evolutionary diversity of the fungi as shown by their morphology and reproductive biology. Prerequisite: BIOL 120. [2-3-0]
- 324 (5) Introduction to Seed Plant Taxonomy – Introduction to seed plant taxonomy emphasizing descriptive morphology and identification. Each student will be required to submit a plant collection. Same as PLNT 258. Prerequisite: BIOL 120. [2-3-0]
- 325 (3) Introduction to Animal Mechanics and Locomotion – Comparative aspects of the functional design of skeletal systems and the mechanics of swimming, flying and terrestrial locomotion, with particular reference to the vertebrates. Prerequisite: BIOL 120. [3-0-0]
- 326 (3) Biology of Invertebrates – A comparative study of invertebrates, with emphasis on marine forms: structure and function, life histories, evolution, and ecology. Prerequisite: BIOL 205. Corequisite: BIOL 300 strongly recommended. [1-4-0]
- 327 (5) Introduction to Entomology – A survey of the structure, classification and biology of insects, with an introduction to spiders, mites and ticks. Prerequisite: BIOL 120. [2-3-0]
- 328** (5) Introductory Parasitology – Classification, morphology and life histories of animal parasites affecting humans and animals. Prerequisite: BIOL 120. [2-3-0]
- 330 (5) Principles of Cytology – Ultrastructure, biogenesis and evolution of bacterial and eukaryotic cells and cell organelles, including their macromolecular basis. Prerequisite: BIOL 200. [3-3-0]
- 331 (3) Developmental Biology – Animal development and its underlying causal principles: introductory embryology. Prerequisites: BIOL 200, 201. BIOC 300 or 302 or 303 is recommended. [3-3-0]
- 332 (6) Protistology – Origin of eukaryotes; diversity and evolution of unicellular eukaryotes irrespective of plant or animal affinities; environmental adaptations, symbiosis and their significance to ecosystems. Prerequisite: BIOL 200. [2-3-0; 2-3-0]
- 334 (3) Basic Genetics – Mendelian genetics, chromosome theory of heredity, linkage, mutation, mapping, gene structure and function, gene interaction, quantitative genetics, population genetics. Credit will be granted for only one of

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** Indicates additional fees are charged for these courses. See Index Fees "Special Fees".

The following Biology courses have been renumbered (old numbers in brackets): (310) 344, (311) 345, (313) 346, (315) 332, (321) 302, (322) 303, (330) 350, (336) 335, (340) 330, (422) 400.

In addition, all undergraduate course in Botany and Zoology have been transferred to Biology (see heading for Botany and Zoology for specific changes).

BIOL 120 (or 101 or 102 or 103 or equivalent) is prerequisite to all Biology courses, except BIOL 153, 343, 344, 345, 346 and 446.

- BIOL 334 and AGSC 213 or FRST 302. Prerequisite: BIOL 200 and 201. [3-0-2]
- 335 (3) Molecular Genetics – Isolation and identification of genes, analysis of gene structure; gene expression and its regulation in prokaryotes and in eukaryotes; developmental genetics. Prerequisite: BIOL 334, MICB 201, AGSC 213 or FRST 302. (This course is the same as MICB 325.) [3-0-2]
- 337 (3) Introductory Genetics Laboratory – A laboratory course demonstrating the fundamental principles of inheritance: Mendel's Laws, sex-linkage, mapping, mutagenesis, chromosomal structure, developmental biology, biochemical and population genetics. Prerequisite: BIOL 334 (may be taken concurrently). [1-4-0]
- 343 (3) Plants and Peoples – The interactions of plants and human societies: the role of people in the origin, evolution and dispersal of food, drug and economic plants, and the influences of plants on human societies. Suitable for upper-level Arts students. [2-2-1]
- 344 (3) Human Heredity and Evolution – Relates genetic and evolutionary concepts to humans. Primarily for upper-level students in the Faculty of Arts. Credit will be given for only one of BIOL 120 or BIOL 344. Not open to students in the Life Sciences. [3-0-2]
- 345 (3) Human Ecology – A review of ecological theory and research methods as they pertain to problems facing human societies today. A group research project on a large-scale applied ecological problem is required. Not for credit in Life Sciences. [3-0-2]
- 346 (3) Microbes and Society – An elementary course in molecular biology primarily for Arts students. The historical development of recent discoveries in molecular biology with emphasis on bacteria and viruses and their interaction with humans. Credit given for one only of MICB 201 and BIOL 346. Not for credit in Life Sciences. [3-0-0]
- 347 (3) Principles and Methodology in Biological Research – Contemporary research in the Botany and Zoology Departments; history and methodology of scientific discovery; seminars on current problems. Restricted to Honours students in Biology. Not to be taken concurrently with BIOL 449. [2-3-0]
- 350 (6) Cell Physiology – The physico-chemical basis of cellular activity; energy relationships, membrane processes, integration and internal control of cellular activities, and cellular signal transduction. The laboratory emphasizes techniques used to study cell function. Prerequisite: BIOL 201. [2-3-0; 2-3-0]
- 351 (3) Plant Physiology I – Mechanisms and regulation of functional processes contributing to the assimilation, transport and utilization of water, mineral nutrients and carbon by plants. Prerequisite: BIOL 120; CHEM 230 is strongly recommended. (Same as PLNT 324 and FRST 311.) [3-2-0]
- 352 (3) Plant Physiology II: Plant Development – Introduction to the processes involved in growth and development: cell division, tissue culture, meristems, differentiation, and the action of major growth regulators. Prerequisite: BIOL 120; CHEM 230 strongly recommended. Credit can be obtained for only one of BIOL 352 and PLNT 325. [2-3-1]
- 353 (6) Vertebrate Physiology – Lectures in organismic physiology for Biology Majors with an emphasis on vertebrates; laboratories with an emphasis on animal physiology. Students from other programs may register by permission of Head. Prerequisite: BIOL 120, CHEM 203 or 213 or 230. [3-3*0; 3-3*0]
- 354 (3) Comparative Environmental Physiology – A survey of physiological adaptations of animals to different environments. Pre- or co-requisite: BIOL 353, or permission of Head of Zoology. [3-0-0]
- 363 (6) Vertebrate Physiology – Lectures in organismic physiology for non-Biology Majors with an emphasis on vertebrates; laboratories with an emphasis on human physiology. Does not satisfy physiology requirement for Biology Programs. Prerequisite: BIOL 120, CHEM 203 or 213 or 230 or permission of the Head of Zoology. [3-3*0; 3-3*0]
- 401 (3) Ecology of Fungi – Environmental requirements of fungi, their role in various ecosystems, and their relationships with other organisms in the habitat. Prerequisite: BIOL 323. [2-3-0]
- 402 (3) Aquatic Ecology – Theoretical and applied limnology; ecology of inland water organisms in relation to physical, chemical and biological factors. One weekend field trip required. Prerequisites: BIOL 300, 302 and 303. [2-4-0]
- 403 (3) Biological Oceanographic Methods – A practical course in analytical techniques and field operations as used in biological oceanography. Pre- or corequisite: BIOL 305/OCGY 309 or permission of the Head of Zoology. BIOL 403 and OCGY 406 are the same course. [1-4-1]
- 404 (3) Ecological Methodology – Quantitative methods for estimating population density, sampling problems of field populations, and experimental design in ecological analysis. Application of computer techniques for the statistical analysis of ecological data. Prerequisites: BIOL 300, 302 and 303. [2-4-0]
- 405 (3) Marine Ecology – A study of the relationship of marine biotic communities to the environment, with emphasis on the intertidal area. Limited to students in Fourth Year. Prerequisites: BIOL 205, BIOL 320, BIOL 300 (may be concurrent), BIOL 302, or their equivalents. [2-3-0]
- 406 (3) Plant Ecology I – Plant community ecology including a consideration of the major approaches to sampling, analyzing and interpreting vegetation patterns. Instruction given in field work and computer analysis of field data. Prerequisite: BIOL 302; BIOL 324 is recommended. [3-3-0]
- 407 (3) Plant Ecology II – Relationships between plants and their physical and biotic environment, including plant population dynamics, geneecology, ecology of reproduction and vegetation change. Students will carry out a short term project in the laboratory or field. Prerequisites: BIOL 302 and 303. [3-3-0]
- 408 (6) Principles of Applied Ecology – Principles of animal and community ecology applicable to the management of animal resources; application of statistical and computer techniques for measuring, analyzing, modelling, and simulating resource systems; problems of multiple resource use. Prerequisite: BIOL 300. [2-2-0; 2-2-0]
- 409** (3) Field Course in Animal Ecology – A two-week intensive course in field methods used in animal ecology. The course is given in the two weeks before first term. A fee will be assessed for living expenses. Pre-registration required. Prerequisites: BIOL 300, 302, and 303; BIOL 310 is recommended.
- 410 (3) Current Topics in Animal Behaviour – Lectures and seminar discussions on selected topics in animal behaviour. Prerequisites: BIOL 310 or permission of the Head of Zoology [2-0-2]
- 411 (3) Insect Ecology – Behavioural, population and community ecology of insects. Interactions between insects and plants and the application of the principles of insect ecology to biological control of insects and weeds. (Same as PLNT 431.) Prerequisite: BIOL 205 or PLNT 331. [3-0-0]
- 412 (3) Phytogeography – Description and interpretation of present and past floristic vegetational patterns; integration of evolutionary, ecological, and phytogeographical concepts. Terrestrial and aquatic plants are considered. Restricted to students of Third and Fourth Years. Prerequisite: BIOL 120. [3-0-0]
- 413 (3) Zoogeography – Distribution of terrestrial and aquatic animals in space and time; restricted to students in Third and Fourth year. Prerequisite: BIOL 120. [3-0-0]
- 414 (3) 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. Prerequisite: Third Year major or honours in Biology or permission of Head of Zoology. [3-0-0]
- 415 (3) Evolutionary Processes in Plants – Experimental and comparative analysis of evolutionary processes, speciation, and phylogenetic patterns in plants. Prerequisite: BIOL 334. [3-0-0]
- 416 (3) Principles of Conservation Biology – Genetics and demography of small and fragmented populations; global and local conservation problems; case histories of endangered animals and plants. Three compulsory weekend field trips. Prerequisite: BIOL 303. [2-0-2]
- 418 (3) Evolutionary Ecology – Ecological adaptation and evolutionary processes in contemporary populations; natural selection, variation, optimization, foraging theory, coevolution, arms races; life history theory, evolution of sex, sexual selection, evolution in managed populations. Prerequisite: BIOL 303. [2-2-0]
- 419 (3) Ecological Parasitology – A survey of ecological concepts as they pertain to parasitic eukaryotic animals including life history, population dynamics, community structure, disease transmission and evolution. Prerequisite: BIOL 303 or BIOL 328. [2-3-0]
- 420 (3) Plant Anatomy – Internal structure, organization and development of vascular plants from both theoretical and descriptive perspectives. Emphasis is on conifers and angiosperms. Prerequisite: BIOL 200 and 210. [2-3-0]
- 421 (3) Paleobotany – A study of fossil plants, emphasizing structure, evolution, and paleoecology. Prerequisite: BIOL 210 or equivalent. [2-3-0]
- 422 (3) Palynology – A study of plant microfossils emphasizing their nature, distribution, recovery, and application to paleoecology. [2-3-0]
- 424 (3) Advanced Seed Plant Taxonomy – Current classification systems and the evidence on which they are based. This course emphasizes the angiosperms. Given in alternate years. Prerequisite: BIOL 324 or equivalent. [2-3-0]
- 425 (3) Biomechanics – An analytical approach to the study of skeletal mechanics and animal locomotion. Selected topics in the structure and properties of biological materials, the functional design of skeletons for locomotion, and the fluid mechanics of swimming and flight. Prerequisite: BIOL 325. [2-3-0]
- 426** (6) Biology of Fishes – Classification, identification, life histories and ecology of fishes, with an introduction to the study of their marine and freshwater environments. Prerequisite: BIOL 204. [2-3-0; 2-3-0]
- 427** (3) Terrestrial Vertebrate Zoology – The natural history, behavioural ecology and conservation of terrestrial vertebrates (and marine mammals). The laboratory includes classification, life histories, and ecology, with particular attention to species from British Columbia. Prerequisite: BIOL 204. [2-3-0]
- 428** (3) Invertebrate Aquaculture – The theory and practice of culturing selected commercially important invertebrates. Prerequisite: BIOL 205 or equivalent. Restricted to students in Fourth Year. [2-3-0]
- 429 (3) Algal Aquaculture – The theory and practice of growing micro- and macroalgae for commercial purposes. Includes historical aspects of algal aquaculture, cultivation principles, practical problems, end products, economics and current status of the industry. Prerequisite: BIOL 120. [3-0-0]
- 430 (3) Evolutionary Genetics – Application of genetics and molecular biology to evolutionary problems. Emphasis on using macromolecular sequence information to answer questions about phylogeny and population structure, and on the evolutionary implications of recent discoveries in molecular genetics. Prerequisite: BIOL 355. [3-0-0]
- 431 (6) Animal Developmental Genetics – Developmental control of gene expression, the genetic and physiological basis of epigenetic determination, inductive interactions, positional information and pattern formation. Prerequisites: BIOL 355 and one of BIOC 300, 302 or 303; BIOL 331 recommended. [3-0-0; 3-0-0]

- 432 (3) Animal Genetics – Chromosome structure, large scale genome mapping, gene interaction and transposable elements; concerted use of genetics and molecular biology to analyse problems in cell biology, development, sex determination and evolution. Prerequisite: BIOL 335. [2-4-0]
- 433 (3) Plant Genetics – Emphasis on molecular aspects. Systems and techniques for genetic analysis in plants; isolation and regulation of plant genes; genetic dissection of plant-specific processes: transposable elements; gene transfer in plants; cytoplasmic inheritance; genetic engineering. Prerequisite: BIOL 335. [3-0-2]
- 434 (3) Population Genetics – Population and quantitative genetics with emphasis on experimental observations and examples from natural populations including the human species. Prerequisite: BIOL 334, AGSC 213 or FRST 302, or equivalent. (BIOL 434/MEDG 434 are the same course.) [3-0-0]
- 435 (3) Cell Biology of Protists – Physiological and genetic basis of growth regulation, the cell cycle, life cycle stages and development in selected protists (usually yeasts and ciliates). Not offered every year. Prerequisite: BIOL 335; BIOL 332 recommended. [3-0-0]
- 436 (3) Fundamentals of Cytogenetics – A comprehensive study of the cell biology of the nucleus as the physical basis of heredity. Prerequisite: BIOL 335 or equivalent. [2-3-0]
- 437 (3) Laboratory in Animal Cell Molecular Biology – The use of recombinant DNA techniques to explore problems in animal developmental biology. Prerequisites: BIOL 331, BIOL 335, and one of either BIOL 201 and BIOC 302 or 303, or BIOC 300, and permission of the Head. [2-4-0]
- 438 (3) Zoological Physics – Animal systems viewed from a physicist's perspective. Topics include sensory systems, energy budgets, locomotion, internal flows, physical advantages of grouping. Prerequisite: PHYS 101 or 121 or equivalent, and BIOL 325. Same as PHYS 438. [3-0-0]
- 439 (6) Plant Biochemistry – A comparative survey of intermediary metabolism, including the chemistry, biosynthesis, distribution and biological function of organic compounds in the plant kingdom. Prerequisites: CHEM 230 or 213 or 203 and either BIOL 201 or BIOC 300. [2-3-0; 2-3-0]
- 440 (3) Functional and Comparative Histology of the Vertebrates – A study of organ systems with emphasis on fishes, amphibians and mammals. For students interested in comparative anatomy, vertebrate zoology or physiology. Prerequisite: BIOL 200. [1-4-0]
- 441 (3) Animal Cell Biology – Analysis of cellular organelles and the intracellular traffic between them, concentrating on mammalian cell systems. Prerequisites: BIOL 335 and one of BIOC 300, 302 or 303. Corequisite: BIOL 350; BIOL 331 highly recommended. [3-0-0]
- 444 (3) Techniques in Plant Molecular Biology – Purification and analysis of nucleic acids, electrophoresis and immunodetection of proteins. Restricted to Honours students with permission of the Head of Botany and the Biotechnology Teaching Laboratory. Prerequisite: BIOL 335. Recommended corequisite: BIOL 433. [0-7-0]
- 445 (3) Bio-analysis – The modelling and analysis of biological processes and experimental data using computers; modelling of animal population characteristics; transport processes in physiology; reduction and analysis of biological data, image analysis and analysis of instrumentation dynamic response characteristics. Prerequisite: BIOL 301. [2-3-0]
- 446 (6) Principles and History of Biology – Consideration of scientific methodology, history and philosophy. Prerequisite: Fourth year standing in any degree program. [3-0-0; 3-0-0]
- 447 (3) Principles and Methodology in Biological Research – Seminars, debates, workshops and tutorials designed to produce competence in specific areas of Biology. Restricted to Honours students in Biology. Must be taken concurrently with BIOL 449. [2-3-0]
- 448 (3-12) c Directed Studies in Biology – A course designed to allow students to undertake an investigation on a specific topic as agreed upon by the faculty member and the student. Permission of the Head of Botany or Zoology, and the supervisor required. No more than six credits of BIOL 448 may be taken with the same supervisor.
- 449 (6) Directed Biological Research – A course designed to allow students to undertake a research project in selected fields. Open only to Honours students in Biology, after consultation with the Head of Botany or Zoology, and with permission of the supervisor. Presentation of a thesis and an oral examination are required. Must be taken concurrently with BIOL 447.
- 450 (3) Molecular Adaptation of Animals to the Environment – Biochemical strategies in the adaptation of animals to the problems posed by their morphology, physiology and environment. Prerequisites: BIOC 300, 302 or 303; BIOL 454 recommended. [3-0-0]
- 451 (3) Algal Physiology – Physiological adaptations of marine algae to environmental factors. Prerequisites: BIOL 320 and one of BIOL 350 or 351 (may be taken concurrently). (Same as OCGY 415.) [2-3-0]
- 452 (3) Plant Development – Molecular mechanisms of organ and cell differentiation and hormone action; developmental genetics; effects of light on development. Emphasis on biotechnological methodologies responsible for recent advances in understanding developmental processes. Prerequisite: BIOL 335. BIOL 352 recommended. [3-0-2]
- 453 (3/6) c Animal Physiology Laboratory – Experiments in animal physiology using computer data acquisition and analysis. Prerequisite: BIOL 353. Corequisite: one of BIOL 354, 450, 454, 455 or 456. [0-6-0; 0-6-0]
- 454 (3) Animal Comparative Physiology – Selected topics in physiology emphasizing comparisons between diverse phylogenetic groups of animals. Prerequisite: BIOL 353, PSYC 360, or BIOL 350, or permission of the Head of Zoology. [3-0-0]
- 455 (3) Comparative Neurobiology – Current approaches in neurobiology, from the cellular to the behavioural level, are examined using representatives of vertebrate and invertebrate nervous systems. Prerequisite: BIOL 353, 350 or PSYC 360. [3-0-2*]
- 456 (3) Comparative Endocrinology – A comparative study of vertebrate and invertebrate endocrinology. Prerequisite: BIOL 353, or permission of the Head of Zoology. [3-0-0]
- 457 (3) Insect Physiology – Physiology of insect growth and development with emphasis on insects of economic importance; physiological basis of insect control. (Offered in alternate years.) Prerequisite: PLNT 331 or BIOL 327. (Same as PLNT 432.) [3-1-0]
- 508 (6) Genetics Seminar
- 522 (3/6) d Topics in Marine Benthic Ecology
- 548 (2-6) c Advanced Topics in Biology
- 549 (12-18) c Master's Thesis
- 649 Ph.D. Thesis
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- Biophysics**
FACULTY OF SCIENCE
- See ANAT 405, 505, 509 and PHYS 305, 405.
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- Botany**
FACULTY OF SCIENCE **BOTA**
- All undergraduate courses in BOTANY are listed under BIOLOGY. The following courses have been renumbered and transferred to BIOLOGY (old Botany numbers are shown in brackets): (301) 320, (306) 321, (307) 322, (308) 323, (310) 343, (311) 324, (330) 351/352, (402) 420, (409) 401, (413) 424, (415) 451, (426) 406, (427) 407, (430) 452, (435) 439, (437) 433, (441) 421, (442) 422.
- 500 (2) Field Botany
- 501 (3) Seminar in Botany
- 502 (0) Thesis Seminar
- 506 (3) Reproductive Biology of Vascular Plants Prerequisite: BIOL 334 and 324.
- 512 (3) Practical Marine Phytoplankton Prerequisite: OCGY 506.
- 515 (6) Advanced Mycology Prerequisite: a course in Introductory Mycology.
- 520 (6) Advanced Phytogeography
- 526 (3) Advanced Plant Community Analysis
- 527 (3) Dynamics of Plant Populations Prerequisite: BIOL 407.
- 528 (3) Current Topics in Plant Biochemistry
- 529 (3) Chemical Plant Taxonomy
- 530 (3) Plant Metabolic Physiology
- 532 (3) Regulation of Plant Growth and Development
- 533 (3) Short Distance Ion Transport
- 544 (3) Plant Molecular Biology Laboratory – Admission to the course is limited and requires recommendation from the Head of Botany or the Director of the Biotechnology Laboratory. Same as PLNT 540 and FRST 503. Recommended prerequisite or corequisite: BIOL 335.
- 545 (3) Plant Genetic Engineering Laboratory – Limited enrolment; requires consent of instructors. Same as PLNT 514 and FRST 509.
- 546 (2-12) c Topics in Botany
- 548 (0) M.Sc. Major Essay
- 549 (6/12) c Master's Thesis
- 649 Ph.D. Thesis
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- Business Education** **BUED**
SEE CURRICULUM STUDIES, FACULTY OF EDUCATION
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- Canadian Studies** **CDST**
FACULTY OF ARTS
- 450 (3) Senior Seminar in Canadian Studies – The Canadian experience from a variety of disciplinary perspectives. Offered by the Chair in Canadian Studies. Enrolment limited to students in the Canadian Studies Major program. [0-2]
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- Clinical Dental Sciences** **CDSC**
SEE DENTISTRY
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- Chemical Engineering** **CHML**
FACULTY OF APPLIED SCIENCE
- 241 (3) Mass and Energy Balances – Introduction to Chemical Engineering: units; stoichiometry; phase equilibria; mass balances; energy balances. [3-0-1; 0-0-0]
- 242 (2) Chemical Process Technology – Introduction to processes used in the chemical process industries; problems and lectures emphasize underlying physical and chemical principles. Prerequisite: CHML 241. [0-0-0; 2-0-1]
- 251 (3) Transport Phenomena I – Fluid Mechanics. Momentum-transfer in fluids in laminar and turbulent flow. Microscopic and macroscopic material, momentum and energy balances. Rheology. Dimensional analysis. Flow in conduits. Pumps. Fluid metering. Prerequisite: PHYS 170. Corequisite: MATH 254. [0-0-0; 3-0-2*]
- 261 (1) Chemical Engineering Lab I – Experiments chosen to illustrate principles, physical properties, fluid flow and processes underlying Chemical Engineering. Novel experiments. Field trips may be required. [0-0-0; 0-4* 0-0]
- 341 (3) Diffusional Operations I – Principles and design of equipment for equilibrium and non-equilibrium stagewise separation by distillation, absorption, adsorption, extraction, etc. for binary and multicomponent systems using analytical, graphical and numerical methods. Prerequisite: CHML 241. [0-0-0; 3-0-2*]

- 345 (2) Applied Thermodynamics I – Basic concepts of thermodynamics; laws of thermodynamics, entropy balance, thermodynamic properties of pure fluids, physical phase equilibrium, thermodynamic potentials, availability, conversion of heat into work by power cycles, refrigeration and liquefaction. Prerequisites: PHYS 153. [2-0-2*; 0-0-0]
- 346 (2) Applied Thermodynamics II – Thermodynamic properties of mixtures, thermodynamic properties from volumetric data, fugacities in gas mixtures and liquid mixtures, calculation of phase equilibria, psychrometry, heat effects, combustion, chemical reaction equilibria, thermodynamic analysis of industrial processes. Prerequisite: CHML 345. [0-0-0; 2-0-2*]
- 351 (3) Transport Phenomena II – Heat and mass transfer; conduction and molecular diffusion; thermal and dilute material, convective transfer; thermal radiation; analogies between momentum, heat and mass transfer; prediction of transfer rates; heat exchanger design. Prerequisite: CHML 251. [3-0-2*; 0-0-0]
- 353 (2) 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. Prerequisites: CHML 242, CHML 251. [2-0-2*; 0-0-0]
- 356 (3) Process Control – Theory and application of automatic control in chemical processes; process dynamics; instrumentation. Prerequisite: MATH 255. [0-0-0; 3-0-0]
- 357 (2) Interfacial Phenomena – Outline of the physics and chemistry of interfaces; discussion of the part played by surface effects in technical processes. Prerequisite: CHEM 251. [0-0-0; 2-0-0]
- 358 (2) Properties of Fluids – Prediction of thermodynamic and transport properties of fluids. Behaviour of single and multi-phase systems. Prerequisite: CHML 345. [0-0-0; 2-0-0]
- 359 (3) Chemical Engineering Economics – Estimation of capital and operating costs; interest calculations; taxes; economic comparison of alternatives; economic optimization. Prerequisite: CHML 242. [0-0-0; 3-0-0]
- 362 (2) Chemical Engineering Laboratory II – Experiments to illustrate and use material presented in courses CHML 345, 351, 353, and STAT 251. Novel experiments. A major field trip is required with expenses to be borne by students. Prerequisites: CHML 251, CHML 261. Corequisite: CHML 353. [0-3-0; 0-0-0]
- 363 (2) Chemical Engineering Laboratory III – Experiments to illustrate and use material presented in 300-level CHML courses. Novel experiments. Field trips may be required. Prerequisites: CHML 251, CHML 261. Corequisite: CHML 353. [0-0-0; 0-3-0]
- 376 (2) Computer Flowsheeting in Chemical Engineering – Theory and practice of computer flowsheeting in chemical plant design. Hands-on use of modern process simulators ASPEN and CADSIM to evaluate chemical plant designs and critical evaluation of the results. [2-0-0; 0-0-0] or [0-0-0; 2-0-0]
- 442 (3) Diffusional Operations II – Principles and equipment design for continuous-contact mass transfer operations including distillation, extraction, drying, humidification, etc. Prerequisites: CHML 341, CHML 351. [3-0-2*; 0-0-0]
- 454 (6) Process Design Project – The design and economic assessment of a major chemical engineering process. A directed-study type course in which the students use previous course material in the synthesis of a detailed design of a practical process. Contact hours are used for the presentation of progress reports and consultation with faculty and industrial advisers. Prerequisites: CHML 341, 346, 351, 353, 356 and 359. Corequisite: CHML 358. [0-0-3; 0-0-3]
- 455 (6) Chemical Engineering Reactor Design – Chemical reaction kinetics, catalytic processes, and reactor design. Prerequisites: CHEM 252, CHML 351. [2-0-0; 2-4-0]
- 457 (2) Process Synthesis – Strategy for conception and evaluation of chemical processes. Assessment of reaction pathways and separation methods. Development of process flow sheets. Network analysis; computer-aided design; optimization of chemical processes. Prerequisites: CHEM 250, 260; CHML 341, 359. [2-0-2*; 0-0-0]
- 464 (3) Chemical Engineering Laboratory IV – Experiments in unit operations involving also instrumentation and control. Novel experiments. Field trip may be required. Prerequisites: CHML 362, 363. Corequisite: CHML 442. [0-6-0; 0-0-0]
- 470 (2) Chemical Pulping Technology – Pulp processing with emphasis on topics related to chemical engineering, including wood chemistry, chemical pulping, chemical recovery, bleaching, chemical by-products and pollution. Prerequisite: Third year Chemical Engineering. [2-0-0; 0-0-0]
- 471 (2) Mechanical Pulping and Papermaking Technology – Pulp and paper processing with emphasis on topics of general engineering interest, including mechanical pulping, stock preparation, papermaking, fibre and paper properties, energy, and project engineering. Prerequisite: Third year Chemical Engineering or Mechanical Engineering. [0-0-0; 2-0-0]
- 472 (2) Hydrocarbon Processing – Conversion of hydrocarbons such as natural gas, crude petroleum and tar sands into fuels and chemical feedstocks. Topics include distillation of complex hydrocarbon mixtures, cracking, hydrotreating, reforming, alkylation and gas sweetening. Restricted to fourth year chemical engineering students or by permission of the instructor. Prerequisite: Fourth year Chemical Engineering. [0-0-0; 2-0-0]
- 473 (2) Water Pollution Control – Legal, environmental and physicochemical aspects of industrial water pollution and its abatement will be surveyed. Current wastewater treatment processes and their industrial application will be discussed. Corequisite: CHML 353. [2-0-0; 0-0-0]
- 475 (2-4) Process Control – Theory and design of control schemes for complex chemical plants; introduction to computer and optimal control of chemical processes. Prerequisite: CHML 356. [2-1-0; 2-1-0]
- 476 (2) Modelling and Optimization in Chemical Engineering – Mathematical modelling of chemical plants and processes. Computer simulation. Introduction to numerical optimization techniques. Prerequisite: CHML 341. [0-2-0; 0-0-0]
- 477 (2) Electrochemical Engineering – Introduction to thermodynamics and kinetics of electrode processes; conduction in liquids and multiphase systems; current distribution; electrochemical reactor design; plant layout; electrochemical process technology. Restricted to fourth year chemical or metallurgical engineering students. Prerequisites: CHEM 252, CHML 241. [2-0-0; 0-0-0]
- 478 (2) Energy and Fuels – Basic considerations in the supply and use of fuels. Combustion, gasification, carbonisation and solvent refining. Energy conservation, description, theory and problem material. [2-0-0; 0-0-0]
- 479 (2) Chemical Engineering Aspects of Occupational Health and Safety – Relationship between current engineering practice and worker health and safety. Engineering analysis of industrial health and safety problems. Prerequisite: Third year Chemical Engineering. [0-0-0; 2-0-0]
- 480 (2-3) Hazardous Waste Processing Technology – Characterization, treatment and final disposal of hazardous waste with emphasis upon chemical engineering principles. Topics to include relevant legislation, in-plant minimization, treatment options and clean-up of contaminated sites. Case studies to be used for illustration. [2-0-0] or [3-0-0]
- 491 (1) Thesis Proposal – Literature searching, planning, equipment design, experimental design for an individual research project leading to a written proposal and oral presentation. Prerequisites: CHML 362, 363. [0-2-0; 0-0-0]
- 492 (5) Thesis – Research project under the direction of a staff member. Prerequisite: CHML 491. [0-0-0; 0-8-0]
- 498 (2) Summer Essay or Engineering Report – This should be written on some subject of scientific or technical interest, based preferably on personal experience. Specifications are issued by the Department at the end of Third Year. Deadline for submission: September 15. Prerequisite: Third year Chemical Engineering.
- 506 (3) Industrial Process Engineering – Mass and energy balances. Stoichiometry. Flow diagrams. Key unit operations for selected process industries in Western Canada with special attention to emission controls and hazards. May require field trips. Not open to Chemical Engineering students.
- 550 (2-4) d Advanced Reactor Design. – Topics vary from year to year, and may include kinetics of fluid-solid reactions of single particles, packed, moving, fluidized and transported bed reactors; rotary kilns; gas-liquid reaction kinetics and reactor design; reactor design for gas-liquid-solid and non-catalytic processes.
- 551 (2-4) d Chemical Engineering Thermodynamics – Pressure-volume-temperature relations; chemical equilibria by Gibbs' method; vapor-liquid equilibria; thermodynamic calculations by third law and quantum-statistical methods; irreversible thermodynamics and information theory.
- 552 (2-4) d Optimization Methods – Mathematical and experimental techniques for optimizing processes. Course content will vary from year to year, but will be chosen from: direct search techniques, unconstrained optimization, Jacobian and Lagrangian optimization, mathematical programming, and variational calculus techniques.
- 553 (2-4) d Mathematical Operations in Chemical Engineering – Topics 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 (2-4) d 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.
- 555 (2-4) d Solvent Extraction and Gas Absorption – Mass transfer in liquid-liquid and gas-liquid systems. Design of extraction and absorption columns. Gas-liquid and liquid-liquid equilibria.
- 556 (2-4) d Distillation – Systems of complete and limited miscibility; multicomponent systems; graphical and analytical design methods; azeotropic and extractive distillation.
- 557 (2-4) d Fluid Dynamics – Topics include tensor analysis; governing equations for Newtonian fluids, exact and numerical solutions to Navier-Stokes equations; creeping flow; flow through porous media; incompressible boundary layers; stability analysis; turbulence.
- 558 (2-4) d Process Heat Transfer – Steady state and transient state studies; calculation and design of industrial heat exchangers.
- 559 (2-6) d Topics in Chemical Engineering – A discussion of some aspects of modern Chemical Engineering. Subject matter varies each year.
- 560 (2-6) d Biochemical Engineering – Kinetics of growth and of biological reactions; principles of agitation; aeration; sterile techniques; product recovery operations; survey of industrial fermentations.
- 561 (2-4) d Particulate and Multiphase Systems – Topics vary from year to year and include electrokinetic colloidal phenomena; packed beds; filtration; sedimentation; two- and three-phase fluidized beds; spouted beds; hydraulic and pneumatic transport; gas, liquid and solid particle mechanics; multiphase flows.

- 562 (2-6) c Advanced Process Design Project – Design and economic assessment of a chemical engineering process using computer modelling and optimization techniques. A directed-study course in which students make use of computational methods to aid in the design of practical processes of industrial significance, and to evaluate design alternates. Prerequisites: CHML 476 and/or CHML 552 or equivalent (may be taken concurrently with the permission of the instructor).
- 563 (2) Applied Heterogeneous Catalysis – Techniques for characterizing catalysts and their surfaces. Commercial methods of preparing catalysts. Chemistry of catalytic reactions and the impact of catalyst properties, mechanisms and kinetics on reactor engineering. Applications of catalytic oxidations, hydrogenations, c-c bond formation and cracking. [2-0-0; 0-0-0] or [0-0-0; 2-0-0]
- 564 (3) Biochemical Engineering Laboratory – Modern bioreactor technology and downstream processing or biotechnology products. Pre- or co-requisite: MICB 318 or CHML 560 or permission of the instructor. Credit will not be given for both CHML 564 and MICB 419.
- 565 (2-6) d Process Control – Theory and design of control schemes for complex chemical plants; introduction to computer and optimal control of chemical processes; experimental projects involving digital computer control of a laboratory reactor.
- 566 (3) Topics in Biochemical Engineering – Analysis of recent engineering and biotechnology research articles. Topics chosen from: bioprocess, biosensor and biomedical literature. Prerequisite: BIOL 101 or equivalent.
- 571 (2-6) d Non-Newtonian Fluid Behaviour – Selections from the following topics: kinematics of deformation and flow, dynamics of continuous media, constitutive equations, physical chemical and molecular aspects of viscosity, engineering applications to pipe flow, mixing, heat transfer. Handling of suspensions and polymers.
- 572 (2-6) d Water Pollution Control – Water pollution control; methods of problem assessment from chemical operations, technology of control with special attention to regional problems. Emphasis varies from year to year with emphasis on industrial problems.
- 573 (2-4) d Less Common Separation Methods – New processes, or developments in existing specialized separation methods. Topics vary from year to year and may include advances in chromatographic and absorption processes, cyclic operations such as parametric pumping, membrane separation processes, and interface concentration methods.
- 574 (2-4) d Equilibrium Properties of Non-Ideal Mixtures – Discussion of various methods of calculating vapor-liquid, liquid-liquid equilibrium and thermal properties, including molecular thermodynamics. Excess free-energy of mixing. Thermodynamic consistency tests. Emphasis on engineering applications and newer approaches.
- 575 (2-4) d Air Pollution Control – Characteristics of various air pollutants, their behaviour in the atmosphere, monitoring problems, technology of particle collection and control of pollutant gases. Particular problems of regional interest are discussed.
- 576 (2-4) d Air Pollution Projects – Advanced study and design projects dealing with specific problems in air pollution control. Prerequisite: CHML 575 or equivalent, or permission of instructor.
- 577 (2-4) d Electrochemical Engineering – Thermodynamics and kinetics of electrode processes; mass transfer in electrolytes; current distribution and scale-up problems; electrochemical reactor design. Applications from inorganic, organic and metallurgical processes and fuel cell development.
- 578 (2-4) d Coal Utilization – Properties affecting utilization of coal; coal combustion; conversion of coal to gaseous, liquid and solid fuels; heterogeneous reactions and chemical kinetics in coal conversion processes; reactor design and modelling of coal combustion, gasification and liquefaction processes; coal as a feedstock for chemicals; environmental aspects of coal conversion.
- 579 (2-4) d Environmental Protection Control in the Pulp and Paper Industry – Environmental regulations, measurement of pollutants, environmental impacts, environmental audits, air pollution control technology, water pollution control technology and sludge management and disposal.
- 580 (2) Pulping Processes – Mechanical pulping theory and practice; groundwood, refiner, TMP; chemistry of major chemical pulping processes; chip quality, digester design and control; testing and evaluation of pulps.
- 581 (2) Pulping Recovery Engineering – Sodium cycle: oxidation of black liquor, evaporation theory and practice, black liquor burning. Calcium cycle: lime kiln; slaking; recausticization; mud washing. Sulphite recovery processes.
- 582 (2) Bleaching Process Engineering – Chemistry of bleaching: chlorination, oxidation; extraction; bleaching sequences: washing; control of bleaching; chlorine dioxide generation; alternative processes, e.g. oxygen bleaching, peroxide bleaching and brightening.
- 583 (2) Pulp Properties and Processing – Fibre and pulp properties; blending and mixing; beating and refining; screening and cleaning; consistency control.
- 584 (2) Papermaking Operations – Flow distribution to paper machine headboxes; drainage; pressing; drying; calendaring; winding; finishing; coating; paper-making chemistry.
- 585 (2) Rheology of Pulp and Paper – Flocculation; flow of pulp suspensions; wet web properties; paper structure; strength and optical properties of paper; paper printability.
- 586 (2) Pulping Technology Laboratory – Cooking of chips in pilot digester under various controlled conditions; evaluation of pulp; pulp bleaching; pulp washing.
- 587 (2) Paper Technology Laboratory – Pulp disintegration; flow of pulp suspensions; handsheet making; pressing; drying; paper testing.
- 588 (2) Administration of Pulp and Paper Operations – A survey of the Canadian and global pulp and paper industry, markets for forest products, economic factors, management practices, communications, taxation, forest management, labour relations, environment control laws and requirements, project management and maintenance practices.
- 589 (2) Modelling, Simulation and Process Control of Pulp and Paper Processes – Introduction to modelling and simulation of pulp and paper processes. Theory and design of control schemes for pulp and paper processes.
- 596 (0) Engineering Report – Engineering report of at least 3000 words on a research or design topic under the supervision of a faculty member.
- 598 Seminar – Presentation and discussion of current topics in chemical engineering research. A required course for graduate students in Chemical Engineering which carries no academic credit.
- 599 (12) Thesis – For M.A.Sc. degree.
- 699 Thesis – For Ph. D. degree.

Chemistry Faculty of Science	CHEM
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CHEM 110 or 121 and 122 is the normal prerequisite for admission to science programs. These courses require MATH 100 or MATH 120 plus a first-year Physics course as corequisites. CHEM 103 is NOT appropriate for students in Faculty of Science programs or those planning to enter the Faculty of Applied Science.

CHEM 110 is open to students who have obtained credit for Chemistry 11 only whereas CHEM 121, 122 are open to students with credit for Chemistry 12. CHEM 103 is open to students from other Faculties with either Chemistry 11 or 12 credit.

*For students in the Faculty of Applied Science.

- 103 (6) General Chemistry – Fundamental principles of chemistry including the molecular structures of inorganic and organic compounds. Not for credit in Faculty of Science programs. Prerequisites: Mathematics 12 (or MATH 111 or 130 concurrently); Chemistry 11 and Physics 11 or their equivalents are recommended. [3-3; 3-3]
- 110 (6) Principles of Chemistry – Fundamental principles of chemistry, particularly the nature of solutions, the solid state and molecular structure. Not open to students with credit for Chemistry 12. This course is recognized for credit in all programs requiring a first-year Chemistry course, but is designed for students with a deficient background in Chemistry. Prerequisites: Chemistry 11, Physics 11. Corequisites: MATH 100 (or 120) [3-3; 3-3-1]
- 121 (3) Structural Chemistry, with Application to Chemistry of the Elements – Fundamentals of structural chemistry; descriptive chemistry of main-group elements, with industrial and environmental applications. This is a required course for all students in the Faculty of Science with credit in Chemistry 12. Prerequisites: Chemistry 11 and 12, Physics 11. Corequisites: MATH 100 (or 120) [3-3-0; 0-0-0]
- 122 (3) General Chemistry – Principles of coordination chemistry, equilibrium, chemical thermodynamics, and organic chemistry. This course is prerequisite for all subsequent courses in Chemistry. Prerequisites: CHEM 121, MATH 100 (or 120) must precede or be taken concurrently. MATH 101 (or 121) concurrently recommended. [0-0-0; 3-3-0]
- 151* (6) Engineering Chemistry – Atomic and molecular structure; solid state chemistry; organic and inorganic chemistry; processes at surfaces; chemical thermodynamics; chemical equilibrium; electrolyte and non-electrolyte solutions; electrochemistry; process rates. Prerequisite: Chemistry 12. [3-3⁺-0; 3-0-1]
- 201 (3) Introduction to Physical and Analytical Chemistry – Principles of chemical kinetics, reaction mechanisms and chemical thermodynamics. Laboratory illustrates physical chemistry principles and analytical chemistry techniques. For Honours students in all B.Sc. programs and in Major Chemistry or Biochemistry programs. Prerequisite: CHEM 110 or 121, 122 and MATH 101. (MATH 200 is strongly recommended.) [0-0-0; 2-4-1]
- 202 (3) Inorganic and Analytical Chemistry – Coordination chemistry of the transition elements. Laboratory illustrates the lecture material and quantitative chemical analysis. Suitable for Honours students in all B.Sc. programs and in Major Chemistry or Biochemistry programs. Prerequisite: CHEM 110 or 121 or 122. [2-4-1; 0-0-0]
- 203 (6) 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: CHEM 110 or 121, 122 and permission of the Head of the Department. [3-3; 3-3]
- 205 (6) 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. Not intended for Honours or Major in Chemistry. Prerequisite: CHEM 110 or 121, 122 (or 103 with standing of 68%). MATH 101 is recommended. Credit will be given for only one of CHEM 201 and 202, or 205 or 208. [3-4; 3-4]
- 208 (6) Physical and Inorganic Coordination Chemistry – Basic thermodynamics and kinetics, solution and phase equilibria, phase rule, thermochemistry. Inorganic crystal and coordination chemistry. This course is intended for students in geological, metallurgical and related sciences and not for Honours or Major in Chemistry. Prerequisite: CHEM 110 or 121, 122 (or 103 with Standing of 68%). Credit will be given for only one of CHEM 201 and 202, or 205 or 208. [3-4; 3-4]

- 213 (6) Organic Chemistry – Fundamental principles of the chemistry of aliphatic, aromatic, alicyclic and heterocyclic organic compounds. This course is intended for students in Honours Life Sciences programs. Prerequisite: CHEM 110 or 121, 122 and permission of the Head of the Department. Credit will be given for only one of CHEM 203 or 213 or 230. [3-3; 3-3]
- 230 (6) Organic Chemistry – The fundamental principles of modern organic chemistry including a discussion of the main classes of organic compounds. Prerequisite: CHEM 103 or 110 or 121, 122. Credit will be given for only one of CHEM 230 or 213 or 203. [3-3; 3-3]
- 250* (2) Inorganic Chemistry – Chemistry of selected groups of inorganic compounds, considered in relation to industrial processes. Prerequisite: CHEM 151 or equivalent. [0-0-0; 2-0-0]
- 251* (3) Physical Chemistry I – Principles of thermodynamics; chemical equilibrium; non-electrolyte solutions; phase equilibria; surface chemistry. Prerequisite: CHEM 151 or 121, 122 or 110. Credit will not be given for both CHEM 251 and 262. [3-0-1*; 0-0-0]
- 252* (2) Physical Chemistry II – Chemical kinetics and catalysis; electrical phenomena at interfaces and irreversible electrode processes. Prerequisite: CHEM 251. [0-0-0; 2-0-1*]
- 255* (2) Chemistry Laboratory – An integrated laboratory course designed to illustrate the principles of physical, organic and inorganic chemistry. Corequisite: CHEM 250, 251, 252 and 260. [0-4-0; 0-4-0]
- 260* (4) Organic Chemistry for Engineers – A description of the properties and reactions of organic compounds with emphasis on compounds and reactions of industrial importance. [2-0-0; 2-0-0]
- 301 (3) Aqueous Environmental Chemistry – Properties of natural waters, including gas and solid equilibria, pH, redox, complexation analysis, corrosion treatment, ion exchange, colloids and microbial transformations. Prerequisite: CHEM 201 and 202, or 205, or 208. (CHEM 203 or 213 or 230 recommended). [3-0-0; 0-0-0]
- 302 (3) Atmospheric Environmental Chemistry – Introduction to structure, composition and chemical processes occurring in Earth's atmosphere, including interactions with solar radiation, stratospheric ozone layer, photochemical smog and acid rain. Prerequisite: CHEM 201 (or 205 or 208). [0-0-0; 3-0-0]
- 304 (6) Physical Chemistry – Diffusion phenomena; ionic mobility; fundamental theories and selected applications of chemical kinetics; introduction to the thermodynamics of multi-component systems; phase equilibria, colligative properties and surface phenomena. Prerequisite: MATH 200 or 253 and CHEM 201 (or 205 with permission). [2-4*-2*; 2-4*-2*]
- 305 (6) Physical Chemistry for Biologists – Elementary thermodynamics, thermochemistry, and electrochemistry; chemical equilibria; chemical reaction rates, colloid science, diffusion phenomena; methods for determining molecular weight, size, and shape of macromolecules. Prerequisite: CHEM 201 and 202; or 205. MATH 200 is strongly recommended. [3-4*-2*; 3-4*-2*]
- 310 (6) Inorganic Chemistry – A systematic treatment of the chemistry of the elements based on the periodic classification, interpreted in terms of structure, mechanism, and theoretical principles. Prerequisite: CHEM 202 or, with permission, 205. Credit will not be given for both CHEM 310 and 335. [2-4*-1; 2-4*-1]
- 311 (4) Instrumental Analysis – An introduction to instrumental methods of chemical analysis including electrochemical methods, spectroscopic methods, mass spectrometry, radiochemical methods and chromatography. Prerequisite: CHEM 201 and 202 (or 205 or 208), or permission of the Head of the Department. [2-4*-0; 1-4*-0]
- 312 (4) Introduction to Quantum Chemistry and Spectroscopy – Introduction to wave and matrix mechanics; angular momentum, magnetic resonance; rotational, vibrational and electronic spectroscopy, and their use in determining molecular structure. Prerequisite: CHEM 201 and 202 and MATH 152 or 221. [2-0-1; 2-0-1]
- 313 (6) Advanced Organic Chemistry for the Life Sciences – A description of the functional chemistry of organic substances that have particular relevance to the life sciences. Prerequisites: CHEM 230 or 213 or 203. Credit will be given for only one of CHEM 313 and 330. [3-4; 3-4]
- 330 (6) Advanced Organic Chemistry – Organic reactions met in natural and industrial processes. Laboratory work: qualitative organic analysis and techniques of organic synthesis. Prerequisite: CHEM 230 or 213 or 203. Credit will be given for only one of CHEM 313 and 330. [3-4; 3-4]
- 335 (6) Introduction to Bio-Inorganic Chemistry – Inorganic chemistry of importance to living systems; physicochemical methods used in its investigation. Prerequisite: CHEM 230 or 213 or 203 and 201 and 202 (or 205). Credit will not be given for both CHEM 310 and 335. [2-4*-1; 2-4*-1]
- 352* (3) Modern Analytical Methods – An introduction to modern methods of analysis including optical, electrochemical and radiochemical methods, mass spectrometry, magnetic resonance spectrometry and chromatography. [2-0-0; 0-4*-0]
- 401 (3) Quantum Chemistry – Introduction to atomic and molecular wave functions. Huckel molecular orbital theory. Introduction to ligand field theory. Elementary group theory. Prerequisite: CHEM 312. [2-0-1; 0-0-0]
- 402 (3) Diffraction Methods – Crystal structures; point and space groups; X-ray diffraction, neutron diffraction, electron diffraction of gases and surfaces. Prerequisite: CHEM 202 (or 205 or 208); CHEM 312 recommended. [2-0-1; 0-0-0]
- 404 (3) Advanced Inorganic Chemistry – Structure, reactivity and bonding of compounds containing homonuclear bonds; cluster chemistry of both main group and transition elements. Chemistry of non-aqueous solvents. Prerequisite: CHEM 310 or 335. [2-0-1; 0-0-0]
- 405 (3) Biophysical Chemistry – Interactions of macromolecules in solution; ligand, antibody and ion binding to macromolecules; thermodynamics of polymer solutions; excluded volume effects; phase separation; partition in two phase polymer solutions. Prerequisite: CHEM 203 (or 213 or 230), and 304 (or 305) concurrently. [0-0-0; 2-0-1]
- 406 (3) Polymer Chemistry – Structure and availability of monomers; Propagation mechanisms; synthesis of polymers with predetermined properties; measurement and interpretation of physical properties of polymers. Prerequisite: CHEM 230 or 213 or 203 or 260, and 304 (or 305 or 252). [2-0-1; 0-0-0]
- 407 (3) Applications of Statistical Mechanics to Chemistry – Introductory concepts of statistical mechanics and statistical thermodynamics. Application to chemistry with emphasis on understanding chemical reactivity. Prerequisite: CHEM 304 or 305. [2-0-1; 0-0-0]
- 408 (2) Chemical Dynamics – Fast reactions; photochemistry and radiation chemistry; homogeneous and heterogeneous catalysis. Prerequisite: CHEM 304. [0-0; 2-0]
- 410 (3) Physical Chemistry of the Solid State – Introduction to the theory of electrons in solids; bands and zones. Absorption of light and excitons. Vacancies, interstitials, electronic defects and dislocations and their roles in chemical reactivity. Prerequisite: CHEM 201 and 202, or 205 or 208. [0-0-0; 2-0-1]
- 411 (3) Synthesis and Chemistry of Natural Products – A discussion of synthetic methods and their application to natural products, particularly in the areas of alkaloids, steroids and terpenes. Prerequisite: CHEM 330 or 313. [2-0-1; 0-0-0]
- 412 (3) Industrial Organic Chemistry – The production and use of primary petrochemicals; plastics and synthetic fibres; pharmaceutical agents; insecticides, herbicides and insect pheromones, dyes, detergents, perfumes and flavours; commercially important microbial transformations. Prerequisite: CHEM 230 or 213 or 203 or 260. [3-0-0; 0-0-0]
- 413 (3) Bio-Organic Chemistry – A discussion of the chemistry of carbohydrates, amino acids, proteins, and biologically important heterocyclic systems. An introduction to the biosynthesis of major groups of natural products. Prerequisite: CHEM 330 or 313 (or 313 concurrently). [0-0-0; 2-0-1]
- 414 (3) Coordination Chemistry – The bonding, stability and stereochemistry of coordination compounds, and the mechanisms of their reactions. Prerequisite: CHEM 310 or 335 (+01 recommended). [0-0-0; 2-0-1]
- 415 (2-4) Chemistry Laboratory – Integrated laboratory course designed to illustrate principles of modern analytical, inorganic, organic and physical chemistry. Prerequisite: CHEM 311 and 310 (or 335); for 3 credits also need CHEM 304 (or 305) or 330 (or 313); for 4 credits also need CHEM 304 (or 305) and 330 (or 313). Students in Chemistry Honours must register for 4 credits. Students in Chemistry Major must register for at least 2 credits, specifically in areas of analytical and inorganic chemistry. For a full 4 credits, eight hours of laboratory per week are required. [0-8-0; 0-8-0]
- 416 (3) Physical and Theoretical Organic Chemistry – Substituent effects, solvent effects, energetics and catalysis in organic reactions. Pericyclic reactions. Prerequisite: CHEM 313 or 330. [0-0-0; 2-0-1]
- 417 (3) Nuclear Chemistry and Radiochemistry – Basic treatment of the nucleus, with analogy to concepts in chemistry. Nuclear stabilities and associated radioactive decay processes. Nuclear structure. Applications of radioisotopes in chemistry. The interaction of radiation with matter. Prerequisite: CHEM 201 and 202 (or with permission 205). [0-0-0; 2-0-1]
- 418 (3) Organometallic Chemistry – The chemistry of compounds containing organic groups directly bonded to metals and metalloids. Emphasis will be placed on the structure and bonding of the compounds and their use in synthetic chemistry. Prerequisite: CHEM 310. [0-0-0; 2-0-1]
- 420 (3) Molecular Spectroscopy – A detailed study of rotational, vibrational and electronic spectroscopy. Prerequisite: CHEM 312 or PHYS 304. [0-0-0; 2-0-1]
- 421 (2) Advanced Instrumental Analysis Laboratory – A laboratory course concerned with the application of instrumental methods to the analysis of natural substances and industrial products. Prerequisite: CHEM 311 or permission of the Head of the Department. [0-4; 0-4]
- 430 (3/6) Developments in Contemporary Chemistry – A review of modern developments in general chemistry for teachers of Secondary School chemistry. (Not for credit in the Faculty of Science.) Course is offered periodically in extra-sessional sessions.
- 435 (3) Bio-Inorganic Chemistry – A discussion of the involvement of inorganic chemistry in biological systems. Chemistry of cations, metalloenzymes, and simpler model systems. Reactions of coordinated ligands, chemistry of sulphur and phosphorus. Prerequisite: CHEM 310 (or 335), and 301 (or 305). [0-0-0; 2-0-1]
- 448 (3) Directed Studies in Chemistry – Students will undertake an investigation of a specific topic as agreed upon by a student and her/his faculty co-supervisors. Normally available only at University College of the Cariboo or Okanagan University College.
- 449 (6) Seminar and Thesis – A weekly seminar on modern chemical science. Original research work under the direction of a faculty member. Required of all Honours students. Open to Major students with a satisfactory standing and permission of the Head of the Department. [1-6; 1-6]
- 501 (3) Introductory Quantum Mechanics – Review of principles. Solution of phenomenological problems by matrix methods. Time evolution of quantum states. Time independent and dependent perturbation theory.

- 503 (3) Equilibrium Statistical Mechanics in Chemistry – Principles of and applications to gases, liquids, solids, radiation, spin systems, chemical equilibrium and chemical reactivity.
- 504 (3) Relaxation Phenomena in Chemistry – Microscopic description of relaxation processes. Introduction to stochastic processes, quantum time dependence and linear response theory, with application to chemical kinetics, NMR, lasers and line shapes.
- 505 (3/6) d Topics in Theoretical Chemistry
- 506 (3/6) d Topics in Statistical Mechanics
- 507 (3/6) d Topics in Physical Chemistry
- 508 (3) Chemical Kinetics and Reaction Dynamics – Macroscopic and microscopic kinetics; transition state theory; collision theory and reaction cross sections, energy distributions, molecular beams and experimental techniques.
- 509 (3) Electron and Photon Impact Phenomena – Basic aspects of collision phenomena. Mass spectroscopy, u.v. and X-ray photoelectron spectroscopy, Auger spectroscopy, electron scattering, electron impact spectroscopy, breakdown of molecules under particle and photon impact. Penning ionization.
- 510 (3) Scattering Theory and Quantum Mechanics – Continuous energy spectra, transition rates and cross sections. Many electron wave functions, semiempirical methods.
- 511 (3) Nuclear Chemistry – Nuclear rotational and vibrational structure, angular correlation theory, nuclear reactions and scattering theory, nuclear synthesis and transuranic elements, mesonic atoms and molecules, muonium chemistry.
- 512 (3) Radiation Chemistry – The study of the interactions of ionizing radiations (and high energy particles) with matter to produce physical, chemical and biological changes, including a discussion of solvated electrons.
- 513 (3) Surface Chemistry – Chemistry of the solid-gas interface: Modern methods for investigation of the structure of solid surfaces and interactions between solid surfaces and gases. Theory of adsorption, surface reactivity and heterogeneous catalysis.
- 514 (3) Crystal Structures – Crystal structures and structural analysis by the methods of X-ray diffraction and neutron diffraction.
- 515 (3) Photochemistry – The primary photochemical process, including photodissociation, photoisomerization, fluorescence and phosphorescence; energy transfer processes; recent advances in the mechanisms of both steady state and flash photochemical reactions.
- 516 (3/6) d Topics in Biophysical Chemistry
- 518 (3/6) d Topics in Magnetic Resonance
- 519 (3/6) d Topics in Molecular Spectroscopy
- 521 (3/6) d Topics in Inorganic Chemistry
- 522 (3) Inorganic Reaction Mechanisms – Substitution reactions and electron transfer processes in inorganic and organometallic chemistry. Catalytic processes involving metal hydrides, carbonyls, and organometallics. Proton transfer reactions. Photochemical reactions of metal complexes.
- 523 (3) Applied Inorganic Chemistry – Topics chosen from: superconductors, batteries, fuel cells, metal organic chemical vapour deposition, inorganic polymers, laser isotope separation, nuclear fuels, environmental concerns.
- 524 (3) Chemistry of Organometallic Compounds – The preparation, properties and structures of organic derivatives of metals and metalloids.
- 526 (3) Bioinorganic Chemistry – Inorganic aspects of biological chemistry; emphasis on the role of metal ions and metalloenzymes.
- 528 (3) Symmetry and Molecular Spectroscopy in Inorganic Chemistry – Group theory, and vibrational and electronic spectroscopy (including optical rotatory dispersion and circular dichroism).
- 529 (3) Structural Methods in Inorganic Chemistry – NMR, ESR, mass spectroscopy, photoelectron spectroscopy (Auger, UV, X-Ray), Mossbauerspectroscopy, electrochemistry.
- 531 (3) Analytical Spectroscopy – Fundamental and practical aspects of optical methods for atomic and molecular analysis: frequency and intensity measurements; absorption, fluorescence, and emission techniques and instrumentation.
- 533 (3) Chemical Instrumentation and Statistical Data Analysis – Experimental design: analytical instrumentation; chemical sensors; signal transduction; signals and noise; analytical figures of merit; significance statistics, data representations and transforms.
- 534 (3) Chromatography and Mass Spectrometry – Gas, liquid and supercritical fluid chromatography. Mass spectrometry: ionization processes, mass analyses, ion molecule reactions, fragmentation processes.
- 535 (3/6) d Topics in Analytical Chemistry.
- 540 (3) Seminar in Chemistry – This course is compulsory for all graduate students in Chemistry.
- 548 (0) Research Conference – Attendance is compulsory for all graduate students in each year of registration for the M.Sc. or Ph.D. in chemistry. No credit value.
- 549 (18) M.Sc. Thesis
- 561 (3) Organic Chemistry – Fundamentals of reactivity and stereoselectivity, including stereoelectronic theory.
- 562 (3) Advanced Organic Chemistry – Organic photochemistry, conformational analysis, stereochemistry of chiral substances.
- 563 (3) Advanced Physical Organic Chemistry – Discussion of acidity functions, photochemistry and reactive intermediates in organic chemistry. Applications of molecular orbital theory to organic systems.
- 566 (3) Advanced Organic Synthesis – Discussion of modern synthetic methods and applications to the synthesis of complex organic molecules.
- 567 (3) Heterocyclic Chemistry – The synthesis, reactions and properties of the principal families of heterocyclic compounds.
- 568 (3/6) d Topics in Organic Chemistry
- 570 (3) Carbohydrates – Synthesis, reactions and chemical properties of mono- and oligosaccharides; applications of these concepts to the study of polysaccharide structures.
- 573 (3) Application of Spectroscopy to Organic Structural – A problem solving course to illustrate the application of n.m.r., mass spectrometry, ORD, CD, etc. to elucidation of structures of organic and organometallic compounds.
- 649 Ph.D. Thesis

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SEE ASIAN STUDIES, FACULTY OF ARTS

Civil Engineering CIVL
FACULTY OF APPLIED SCIENCE

- 200 (3) Engineering and Sustainable Development – Implications of a finite biosphere and the complexities inherent in environmental decision-making. [3-0-0]
- 210 (3) Soil Mechanics I – Soil classification, principle of effective stress, analysis of seepage, filter criteria, introduction to shear strength and slope stability analysis. Prerequisites: CIVL 230 or MECI 260 Corequisites: GEOL 150 and one of CIVL 215, CHML 251 or GEOL 342. [3-2*-0]
- 215 (3) Fluid Mechanics I – Fluid properties, hydrostatics, kinematics, and fluid dynamics: energy and momentum methods with applications. Dimensional analysis, modelling, introduction to flow in pipes and forces on immersed objects. Prerequisites: PHYS 170, MATH 154. [3-0-2]
- 220 (3) Civil Engineering Materials I – Simple physical aspects of materials; structure of materials; mechanical properties of materials; test methods for determining mechanical

- properties. The emphasis of this course will be on the relationship between the structure of materials and their mechanical properties. Attention will also be focused on the experimental problem involved in determining mechanical properties. Prerequisite: CHEM 151. Co-requisite: CIVL 230. [3-2*-0]
- 221 (3) Civil Engineering Materials II – The structure and properties of common Civil Engineering materials: aggregates, Portland cement, concrete, asphalt cement and concrete, timber, metals and ceramics. The emphasis of this course will be on the relationship between the structure of materials and their mechanical properties. Attention will also be focused on the experimental problem involved in determining mechanical properties. Prerequisite: CIVL 220. [0-0-0; 3-2*-0]
- 225 (3) Computer Applications in Civil Engineering – Introduction to computer graphics, interactive programming and use of numerical algorithms. Use of micro-computers, typical operating systems and languages, peripherals. Laboratory to provide practical experience with various systems and devices. Civil Engineering applications emphasized. Prerequisite: CPSC 152. [1-3-0]
- 228 (3) Mechanics in Civil Engineering Design – Basic principles of engineering mechanics with reference to civil engineering problems: equilibrium of rigid elements of engineering systems, free body diagrams, analysis of trusses, shear and bending moments in beams, kinematics and kinetics of rigid bodies, single degree of freedom vibrations. Prerequisite: PHYS 170. [3-0-1; 0-0-0]
- 230 (3) Solid Mechanics I – Review of statics; beam forces, shear and moment diagrams; definitions of stress and strain; constitutive relations; stresses in elementary rods, shafts, beams and tanks; Mohr's circle; deformations of beams and shafts; introduction to indeterminate structures. Prerequisite: PHYS 170, MATH 154. Corequisite: CIVL 228. [3-0-2; 0-0-0]
- 231 (3) Structural Mechanics and Design. – Advanced beam bending; principle moments of inertia; plastic bending capacity; column buckling; beam columns; concepts of structural design, load and strength uncertainty; design of wood and steel members. Prerequisite: CIVL 230. [0-0-0; 3-0-2*]
- 235 (4) Plane Surveying – Theory and application of plane surveying methods. Introduction to and use of compass, transit, tape, and level. Construction and topographic surveys. Reduction of field data and construction of drawings. Demonstration of modern instruments, remote sensing methods and geographical information systems (GIS). This course commences immediately after spring examinations and continues full time for two weeks, including Saturdays. Information on the exact dates, and registration forms, will be available in the Civil Engineering Office following publication of the final Examination Timetable.
- 300 (3) Engineering Economic Analysis – Cost concepts; time value of money operations; comparison of alternatives; depreciation and taxes; economic analyses of projects in the public sector; break-even sensitivity and risk analysis; decision models. Prerequisite: 3rd Year standing. [3-0-0; 0-0-0]
- 301 (3) Optimization and Decision Analysis in Civil Engineering – An introduction to the application of systems engineering, optimization, and applied probability to the design and operation of civil engineering systems. Prerequisites: CIVL 225; third year standing Corequisite: STAT 251(0-0-0;3-0-0)
- 305 (3) Water Treatment and Waste Management – Processes used in water and wastewater treatment. Conditions which necessitate treatment of water or wastewater, water and wastewater treatment processes and plant design. Municipal services required and associated with solid waste management. Corequisite: CIVL 205 [0-0-0;3-0-0]
- 306 (3) Environmental Impact Studies. – A course to familiarize the student with environmental impact assessment legislation and to discuss design and construction consid-

- erations useful in minimizing and mitigating such impacts. Corequisite: CIVL 316. [3-0-0]
- 310 (6) Soil Mechanics I – Origin, nature and composition of soils; phase relationships; grain shape, mineral composition and size distribution; soil structure; plasticity of fine grained soils; field identification and classification; compaction; permeability; capillary phenomena and frost heave; analysis of seepage in one and two dimensional flow nets; principle of effective stress; stress distribution in soil masses; Terzaghi's one dimensional consolidation theory; primary, and secondary consolidations; settlement analysis. Prerequisites: CIVL 230 or MECH 260. Corequisites: GEOL 150 and one of CIVL 215, CHML 251 or GEOL 342. [3-2*-0; 0-0-0]
- 311 (3) Soil Mechanics II – Consolidation and shear strength of soils, with application to settlement and stability analysis of embankments, retaining walls, shallow footing and pile foundations. Prerequisite: CIVL 310. [3-2*-0]
- 315 (4) Fluid Mechanics II – Two dimensional flow around immersed objects; velocity and pressure fields, lift and drag on cylinders and aerofoils; evaluation of wind loads on structures; unsteady flow in pipes; frictionless waterhammer analysis; analysis and design of pipeline systems, sanitary sewage collection systems, pumps and turbines. Prerequisite: CIVL 215. Corequisite: MATH 257. [2-2*-2; 0-0-0]
- 316 (4) Open Channel Hydraulics – Steady open channel flow in rectangular sections; application of energy and momentum principles; non-uniform steady flow in open channels; lake discharge and control sections; unsteady open channel flow, frictionless theory; elementary gravity wave theory; falling and rising tides in estuaries; applications to sluice gate operations, pumps in channels, dam burst, kinematic waves; hydrologic routing; sediment entrainment and stable channel design; and the analysis and design of stormwater collection systems. Prerequisite: CIVL 215. Corequisite: MATH 257. [0-0-0; 2-2*-2]
- 321 (2) Laboratory Project in Engineering Materials – An experimental investigation of any material property of interest. Students in groups of 2-4 will be expected to define a materials problem, develop a means of studying the problem experimentally, carry out the experiment, and write a formal report. Each group will be supervised individually by a member of faculty. Lectures will include a discussion of occupational hygiene and safety. Prerequisite: CIVL 221. [0-0-0; 1-2-0]
- 331 (3) Structural Design II – Introduction to limit states design of steel components for buildings. Use of micro-computers and commercial software (spreadsheets) for assignments in steel design. Prerequisite: CIVL 330. [0-0-0; 3-0-2*]
- 332 (3) Structural Analysis I – Introduction to indeterminate structural analysis methods: direct stiffness method; plane and space trusses, plane frames; virtual work; plastic collapse mechanisms; energy methods. Prerequisites: CIVL 231, MATH 152. [3-0-0; 0-0-0]
- 340 (3) Transportation Engineering I – The analysis and design of the elements of transportation facilities in development of transport technology; vehicle motion; vehicle/pavement interaction; elements of road design; principles of queuing and roadway capacity; rail transit performance and capacity analysis; economics as applied to transport. Prerequisite: CIVL 310. Corequisite: STAT 251. [0-0-0; 3-0-2]
- 400 (3) Construction Engineering and Management – Management of the firm: strategic planning; marketing; organizational structure and behaviour. Project delivery systems: traditional; construction management; turnkey; project management. Network planning methods. Activity planning, including construction methods selection. Estimating, bidding and bonding. Project control tools and procedures. Safety considerations and quality control. Prerequisites: CIVL 300, 301. [0-0-0; 3-0-0]
- 402 (2) Engineering Law and Contracts in Civil Engineering – Aspects of law encountered in engineering, with emphasis on contracts and specifications. Contract documents, including preparation of an assigned specification. Torts and independent contractor; sources of law and major subdivisions, Companies; partnerships; mechanics liens; agency; evidence; expert witness. Engineers Act and Code of Ethics; The Association of Professional Engineers and Geoscientists of B.C.; industrial design and trade secrets; employment law for engineers; liability implications of consulting engineering. Prerequisite: Fourth-year standing. [0-0-0; 1-2-0]
- 405 (3) Environmental Impact Studies – A course to familiarize the student with environmental impact assessment legislation and to discuss design and construction considerations useful in minimizing and mitigating such impacts. Description of the process of identifying and evaluating impacts will be provided. However the major thrust of the course will deal with engineering solutions to problems identified by other disciplines. Prerequisite: CIVL 205. [3-0-0; 0-0-0]
- 407 (3) Basic Sanitary Engineering Concepts – A laboratory course to familiarize the student with the testing procedures used in water quality studies and in the operation of water and wastewater treatment plants. Prerequisites: CIVL 205, CHEM 151. [1-3-0; 0-0-0]
- 410 (3) Foundation Engineering I – Design of spread footings, rafts and pile foundations according to modern professional practice. Procedures for estimation of bearing capacity and settlements, both immediate and long term. Design of structures associated with foundation excavations and site developments such as braced cuts, retaining walls and anchored sheet pile bulkheads. Strong emphasis on the role of geological history, penetration testing and simple index properties in prediction of foundation performance. The principles of design and characteristics of field performance are illustrated by suitable case histories. Prerequisite: CIVL 311. [3-0-0]
- 411 (3) Foundation Engineering II – Aspects of Geotechnical Engineering Design considerations illustrated by case histories pertinent to B.C. Topics include: site investigation, terrain analyses, insitu testing, groundwater problems, deep foundations, tie back walls and bracing, tailings impoundments, Northern construction, ground ice, dikes and dams engineering. Many case histories presented in part by prominent consulting engineers in B.C. Prerequisite: CIVL 311. [0-0-0; 3-0-0]
- 413 (3) Earth Dams – Purpose and types of dams, design criteria, design construction sequence; compaction; seepage principles; seepage control; filter design, factors influencing the design section of earth dams; stability and deformation under static and earthquake loading; slope protection; field instrumentation. Corequisite: CIVL 311. [0-0-0; 3-0-0]
- 415 (3) Water Resources Engineering – An introduction to engineering hydrology and the engineering design and planning of water supply, hydropower, irrigation and navigation as well as drainage and flood control. Prerequisites: CIVL 316 and STAT 251. [0-0-0; 3-0-0]
- 416 (3) Environmental Hydraulics – Application of hydraulic engineering principles to problems of environmental concern. Pollutant transport and dispersion. Mixing in rivers and lakes. Theory of jets and plumes. Design of outfall diffusers. Prerequisite: CIVL 316. [0-0-0; 3-0-0] or [3-0-0; 0-0-0]
- 417 (3) Coastal Engineering – General discussion of waves, linear wave theory, finite amplitude waves, standing waves, seiches; harbour design; wave shoaling, refraction and diffraction; beaches and coasts; wave statistics, wave generation; wave forces on piles, walls and breakwaters; tides; instrumentation and modelling techniques. Prerequisites: CIVL 315, CIVL 316 [3-0-0; 0-0-0] or [0-0-0; 0-0-0]
- 418 (3) Hydrology I – An introductory course to civil engineering hydrology to include: weather and hydrology, precipitation measurement and characteristics, streamflow measurement and characteristics, evaporation and snowmelt, hydrograph techniques, reservoir and channel routing, precipitation and runoff, statistical techniques in hydrology, and hydrologic modelling in large basins. Prerequisite: CIVL 315, CIVL 316. [0-0-0; 3-0-0]
- 420 (3) Concrete Technology – Properties of concrete making materials; Portland cement, aggregates, water, and admixtures; proportioning of concrete mixes and construction practices; mixing, transporting, placing, and curing; properties of hardened concrete; strength, fracture, fatigue, creep, shrinkage, and durability; modern developments in concrete technology; and new materials and practice. Prerequisite: CIVL 221. [0-0-0; 3-0-0]
- 430 (3) Structural Design III – Design of concrete structures, including beams, columns, slabs and footings. Prerequisite: CIVL 330 and 332. [3-0-0; 0-0-0]
- 432 (3) Advanced Structural Steel Design – Frame connections with high-strength bolts and welds, highway bridge loadings, composite beams of steel and concrete, welded steel plate girders. Prerequisite: CIVL 331, CIVL 332. [3-0-0; 0-0-0]
- 433 (3) Advanced Concrete Design – Design of continuous reinforced concrete building frames and structures. Prerequisite: CIVL 430. [0-0-0; 3-0-0]
- 435 (3) Advanced Structural Analysis – The force method and example applications, shear walls; extension of displacement method, shear deformation, curved members; nonlinear effects, P-delta, buckling, elasto-plastic analysis. Introduction to the finite element method. Prerequisite: CIVL 436 [0-0-0; 3-0-0]
- 436 (3) Matrix Structural Analysis and Dynamics – Further techniques in matrix structural analysis; non-rigid supports, temperature-shrinkage effects, computer implementation; matrix representation of structural dynamics; mode shapes, natural frequencies, continuous systems; lumped mass models, modal analysis, response spectra. Prerequisite: CIVL 332 3-0-0; 0-0-0
- 437 (2) Conceptual Structural Design – A study of the merits of various structural forms and functions; concept development via case studies, relation of concept to final design. Corequisites: CIVL 430, 431, 432 [2-0-0; 0-0-0]
- 438 (3) Introduction to Seismic Design – Seismicity, code forces, distributions of shear and moments, dynamic effects, ductility; seismic design in steel, concrete, and masonry; seismic analysis methods. Prerequisite: CIVL 430, 431, 432. Corequisite: CIVL 433, 435. [0-0-0; 3-0-1]
- 440 (3) Transportation Engineering II – Traffic operations and network analysis: traffic studies and data design; traffic stream flow and roadway analysis; weaving and interchange ramp analysis; intersection traffic control measures and control design; progressive signal system design; flows prediction; road network simulation and assignment algorithms; motor vehicle accident analysis; field exercises. Prerequisite: CIVL 340. [2-0-2; 0-0-0] or [0-0-0; 2-0-2]
- 441 (3) Transportation Planning Methods – An introduction to transportation systems planning: data needs; surveys and analysis; sampling techniques; trip generation, gravity concepts and models; mode split by deterministic methods; introduction to choice theory and models; route assignment by shortest path algorithms; stochastic assignment; transport system evaluation. Computer and interactive graphics application. Prerequisite: CIVL 340. [0-0-0; 2-0-2]
- 445 (3) Engineering Design and Analysis – Students will be expected to: Either: design and carry out an experimental project, including, where applicable, problem identification, purpose and scope of experimental procedures, equipment design and instrumentation performance testing, data logging, interpretation and analyses, and conclusions; the project may be either laboratory or site oriented; Or: carryout a project through the development of conceptual, preliminary and final design, which might also include feasibility study, economic aspects, material selection and design and and construction scheduling. Comprehensive group report required 2 weeks before the end

- of classes in the second term. Groups of 2 to 4. Prerequisite: Fourth-year standing. [0-2-0; 0-4-0]
- 450 (3) Natural Hazards Engineering – Description, analytical methods, case histories, and environmental aspects of engineering protection against natural hazards. Topics: extreme event statistics, mountain slope hazards, flooding, earthquake, risk mapping, zoning, vulnerability analysis and field trip. (3-0-0)
- 493 (3) Case Studies of Construction Methods – Examination of construction methods including factors affecting productivity and safety. Treatment of relationship between design and construction. Techniques for measuring onsite performance. Principles illustrated through case studies presented by guest. Prerequisite: 4th year standing. [2-0-1; 0-0-0]
- 498 (1-6) Directed Studies – Requires approval of the Department Head.
- 502 (3) Structural Stability – Concepts of stability, elastic and elastic-plastic buckling of columns and beams, torsional buckling, energy methods and approximate solutions, frame stability, buckling of plates and shells.
- 504 (2) Seismicity and Seismic Design Parameters – Causes of earthquakes. Fault mechanisms. Wave motions. Magnitudes and intensities. Regional seismicity and risk analysis. Attenuation of ground motion parameters with distance. Development of site specific ground motions. Selection of earthquake records and construction of design spectra.
- 505 (2) Earthquake Resistant Structures I – Response of structures to earthquakes; concept of ductility; development of seismic design codes. Hierarchy of analytical tools; quasi-static, modal, and nonlinear analyses. Modelling of structures. Soil-structure interaction.
- 506 (2) Earthquake Resistant Structures II – Design of steel, concrete, masonry and timber structures. Assessment and retrofit of existing structures.
- 507 (3) Dynamics of Structures I – Fundamental analysis of structures subject to dynamic loading; single and multi-degree of freedom systems; free and periodic vibrations; earthquake response spectrum analysis; nonlinear response via numerical integration; introduction to continuous system
- 508 (3) Dynamics of Structures II – Multi-degree of freedom and continuous systems; general normal mode theory with damping; forced vibrations with special reference to the earthquake problem; introduction to random vibrations.
- 509 (3) Random and Nonlinear Vibrations – Stochastic processes. Power spectral density. Gaussian processes. Random response of linear structural systems. Applications to discrete and continuous systems. Introduction to nonlinear systems and chaotic response.
- 510 (3) Behaviour of Steel Structures – Elastic response; elastic limit; capacity design; non-elastic stability problems of members and frames; plastic design and analysis; connection design for ultimate loads.
- 511 (3) Advanced Topics in Steel Structures – Seismic design of steel buildings; composite design; welding of steel; corrosion protection; application of CAD in steel design.
- 513 (3) Concrete Structures – Response of prestressed and non-prestressed concrete elements and structures; comparison of analytical predictions and experimental results; simplified design procedures. [3-0-0]
- 514 (3) Advanced Topics in Concrete Structures – Seismic response of concrete structures; design of prestressed concrete buildings and bridges; concrete masonry structures; plasticity in reinforced concrete. [3-0-0]
- 515 (3) Bridge Design and Construction – Performance requirements, loads, conceptual and detailed design, approximate methods of analysis, erection methods, bridge and foundation types, case studies from recent designs.
- 516 (3) Behaviour of Timber Structures – Design problems in timber structures; effects of size; environment; duration of load; connections.
- 517 (3) Advanced Topics in Timber Structures – Behaviour of timber structural systems. Simulation of system response and structural reliability. Effect of quality controls.
- 518 (3) Reliability and Structural Safety – Probability theory and random variables. Performance functions and probability of non-performance: simulations and FORM/SORM methods. Applications. System reliability. Time-dependent reliability and introduction to stochastic processes.
- 520 (3) Construction Planning and Control – Planning of civil engineering projects using networking techniques and time space methods. Treatment of resources and cash flow. Activity planning. Concepts of control at the project and activity levels. Prerequisite: CIVL 490 or 400.
- 522 (3) Project and Construction Economics – Review of engineering economics; investor objectives; capital expenditure modelling. Project financing mechanisms and preparation of feasibility studies, with emphasis on civil engineering projects. Cost modelling and cost estimating relationships for design and construction decisions. Sensitivity analysis. Case studies. Prerequisite: CIVL 400.
- 523 (3) Project Management for Engineers – Perspectives of project management as it relates to civil engineering. Case studies are used to illustrate key issues.
- 524 (2) Legal Aspects of Project and Construction Management – Legal relationships in the construction industry. Prerequisite: CIVL 402.
- 528 (2) Advanced Concrete Technology – Special topics in concrete: creep and creep prediction; durability; corrosion of concrete; quality control; non-destructive testing; new types of concrete. Prerequisite: CIVL 420.
- 529 (3) Linear Elasticity – Stress and strain in three dimensions, fundamental field equations of linear elasticity; equilibrium, compatibility, Hooke's law; Papkovitch-Neuber solution, plane stress and plane strain; torsion, torsion of thin-walled members with warping restraint; plate theory. Same as MECH 561; credit will be given for only one of MECH 561 and CIVL 529.
- 531 (3) Analysis of Plates and Shells – Theory of thin plates and shells; numerical modelling. Limit analysis of plates. Stability and buckling.
- 533 (3) Energy Theorems of Structural Mechanics – Generalized coordinates and configuration space; formulation of the variational problem; virtual work and energy principles; classical energy theorems; stability; calculus of variations; direct methods; Reissner's principle; Hamilton's principle.
- 535 (3) Advanced Mechanics of Solids – Advanced topics in the theory of solid mechanics; wave propagation; viscoelasticity; plasticity; numerical modelling.
- 537 (3) Finite Element Method – Boundary value problems; review of finite differences; weighted residual methods, Galerkin; computer algorithms. Example applications, Laplace's equation, two-dimensional elasticity, plate bending.
- 538 (3) Advanced Topics in the Finite Element Method – Practical programming; numerical studies, applications in vibrations, shells, nonlinear material or geometry, structural timber systems, steel and concrete structures. Prerequisite: CIVL 537.
- 540 (3) Waves and Wave Effects – Wave hydrodynamics; wave statistics and design wave selection; wave forces; wave effects on coastal and offshore structures.
- 541 (3) Environmental Fluid Mechanics – Analysis of density stratified flows with application to water quality problems in inland and coastal waters.
- 544 (2) Steady Flow in Open Channels – Energy and momentum principles; uniform and gradually varied flow, back-water curves. Flow through transitions, bends and obstructions.
- 546 (3) Sediment Transport – Mobile-boundary open channel flow. Design of unlined silt-stable channels: river bed scour. Application to the coastal environment. Beach transport processes.
- 547 (2) Estuary Hydraulics – Estuary dynamics and estuary classification; the effect of engineering works on salinity intrusion; physics of estuary pollution and the use of computer and hydraulic models.
- 548 (2) Coastal and Offshore Modelling – Laboratory and numerical modelling in coastal and offshore hydrodynamics: model laws; laboratory facilities; instrumentation; numerical techniques; applications to wave-structure interactions, wave hindcasting, wave propagation, sedimentation problems and mixing processes.
- 551 (2) Advanced Hydrology – Modelling hydrologic runoff processes. Flow forecasting models for mountain watersheds. Estimation of design rainfall and snowmelt.
- 554 (2) Water Resource Management – Patterns of development. Management considerations for water resource systems, including comprehensive river basin development. Application of analytical techniques.
- 555 (2) Analysis of Civil Engineering Systems – Concepts and techniques of operations research, decision analysis, and systems engineering applicable to Water Resources and Transportation Engineering and Construction Management. Prerequisite: CIVL 375 or 301.
- 556 (2) Professional Decision Making – The application of decision analysis and risk analysis to professional decision making in civil engineering. Case studies are used for illustration.
- 557 (2) Toxic and Hazardous Waste Treatment and Disposal – Environmental impact of disposal of toxic and hazardous wastes. Treatment technology for detoxification. Landfill disposal and self attenuation in landfills and underlying soils. Incineration with municipal wastes.
- 558 (2) Water Resource Seminar – Directed case studies. Application of concepts, processes and techniques of water resource planning to specific problems.
- 559 (2) Topics in Advanced Waste Treatment – Processes for removing wastewater impurities that are not effectively removed by secondary treatment; investigation of disposal practices that make use of the impurities as resources.
- 560 (3) Sanitary Engineering Design – Design problems in water and sewage treatment, with emphasis on the hydraulic and sanitary engineering considerations.
- 561 (2) Solid Waste Treatment Systems Design – Design of sanitary landfills, compost plants, recycling systems; incineration concepts. Environmental impact analysis of various treatment methods. Relative costs of system components. Course structure will be tailored to the student's background and areas of interest.
- 562 (3) Environmental Contaminant Analysis Laboratory – A laboratory course to familiarize the student with environmental engineering laboratory procedures, instrumental analysis, sampling techniques and data analysis.
- 563 (3) Unit Operations and Unit Processes in Sanitary Engineering – Laboratory classroom and field assessments of sanitary engineering operations and processes. Prerequisite: CIVL 569.
- 564 (2) Engineering Management of Solid Wastes – Characteristics of solid wastes; introduction to solid waste collection, treatment and disposal. Evaluation of current practice and analysis of future potential of landfills, composting, combined treatment, recycle and re-use.
- 565 (2) Water Supply Engineering – An outline of water quantity and quality requirements of water users, and the development of possible courses of action for meeting these requirements. Costs of implementing schemes will be considered.
- 566 (3) Transport and Mixing of Pollutants in Aquatic Systems – Mixing and dispersion of pollutants in inland and coastal

- waters. Pollutants associated with pulp mills, waste treatment plants, mining operations and other sources. Natural processes (physical, chemical and biological) affecting the ultimate fate and impact of these pollutants. Corequisite: CIVL 116.
- 567 (2) Water Pollution Control Engineering – Industrial waste survey and design problems. Appraisal and analysis of existing water quality management systems. Water quality and effluent standards.
- 568 (2) Water Pollution Engineering and its Ecological Impact – The chemical and biological processes involved in the cycling, transformations and distribution of inorganic compounds (nitrogen, phosphorus, sulphur and trace metals) and organic compounds (pesticides, hydrocarbons and detergents) in polluted water environments. Prerequisites: Either ZOOE 401, CIVL 567 or consent of instructor.
- 569 (4) Biological Waste Treatment – Development of the principles of secondary, biological treatment processes, with application to both municipal and industrial wastewater treatment. Discussion of different treatment methodology, incorporating both aerobic and anaerobic microbiological processes. Corequisite: MICB 417.
- 570 (3) Soil Mechanics – Soil composition and geological factors affecting engineering properties, stress and strain at a point, principle of effective stress, stress-strain relations; theories of primary and secondary consolidation, settlement, shear testing equipment, stress-strain and strength behaviour of soil under static and dynamic loading.
- 572 (3) Environmental Geotechnique – Physical-Chemical principles of clays, clay mineralogy, structure and sensitivity of clays, engineering behaviour of compacted clayey soils, coupled fluid flow; ground-water pollution site investigation methods, in-situ and laboratory tests; design of remediation systems.
- 573 (2) Numerical Methods in Soil Mechanics – Applications of finite difference and finite element methods of analysis to the solution of stress, seepage, and consolidation problems. Foundation vibrations. Seismic analysis of earth structures.
- 574 (3) Experimental Soil Mechanics – Experimental studies of advanced aspects of soil behaviour; compressibility; shear strength; pore water pressure; dynamic tests; advanced instrumentation and measurement techniques; research reports required. Prerequisite: CIVL 570.
- 575 (2) Geotechnical Ocean Engineering – Submarine geotechnical investigations properties of seafloor soils, foundations for offshore structures, shallow foundations (gravity platforms), deep foundations (jacketed platforms), submarine slope stability; anchors and mooring systems. Prerequisite: CIVL 311.
- 577 (3) Soil Exploration for Engineering Design – Advanced methods of subsurface investigation; determination of stratigraphy and engineering properties by in-situ testing. Emphasis on field work and interpretation of results.
- 578 (2) Principles of Pavement Design – Review of the principal factors and methods involved in the design of rigid and flexible highway pavement structures; pavement structure and types; factors involved in pavement structure design; rigid pavement design methods; joints in rigid pavements; flexible pavement design methods; distress mechanisms in flexible pavements; pavement condition evaluation; and strengthening existing pavements.
- 579 (2) Geosynthetics – Material properties; standard tests data; soil-geosynthetic interaction; design of reinforced soil structures (walls, slopes, embankments); design of filtration and drainage works; design of geomembrane-lined waste containment facilities; regulatory requirements; case history applications.
- 580 (2) Stress-Strain Models for Soil – Stress and strain, linear elastic and the incremental linear stress-strain models; stress dilatancy and dilatant elastic models; soil behaviour and critical state concepts; concepts of plasticity; elasto-plastic models based on critical state; other stress-strain models. Prerequisite: CIVL 570.
- 581 (3) Soil Dynamics – Seismic loading and its effect on earth structures; dynamic response of single, and multi-degree of freedom systems and continuous systems; behaviour of soil under dynamic loading; pore pressure generation and liquefaction effects; seismicity and seismic design parameters; dynamic analysis of earth structures; seismic design of soil-structure systems.
- 582 (3) Transportation Engineering Impacts – Methods to measure, predict and evaluate impacts of transportation modes. Discussion of measures to reduce impacts.
- 583 (3) Urban Engineering Methods and Models – The application of urban analysis methods and models to the design of municipal and transportation engineering systems.
- 584 (3) Simulation and Modelling of Civil Engineering Systems – Random models, queue models, and discrete event simulation in construction management, urban and transportation engineering.
- 586 (3) Urban Transportation System Analysis – Development and use of urban transportation models, including travel generation models, distribution models, mode choice models and system evaluation.
- 587 (3) Transit Operations Engineering – Engineering analysis of public transit operations. Includes technological characteristics of operating systems, scheduling, routing, operating costs, fare structure, techniques of control, mode split analysis and the operational feasibility of new transit modes.
- 588 (2) Transit Design Engineering – Design of bus and fixed rail transit facilities including supporting ways, stations, and analysis of system capacity and costs.
- 589 (2) Traffic Flow Theory – A discussion of the various traffic flow distribution models; gap acceptance, queuing processes, traffic flow simulation with applications to intersection design, signal system design and control of urban freeways.
- 595 (0) Graduating Paper.
- 596 (6) Project in Civil Engineering – Comprehensive study, preparation of a report and oral presentation of an assigned topic in civil engineering. To be done under the joint supervision of a faculty member and an industry/government representative. For M.Eng. students in the Professional Partnership Program only.
- 597 (0) Seminar – Presentations and discussions of current research topics in various disciplines of Civil Engineering.
- 598 (1-6) d Topics in Civil Engineering
- 599 (6-12) d M.A.Sc. Thesis
- 699 Thesis – For the Ph.D. degree.

Classical Studies CLST
DEPARTMENT OF CLASSICS, FACULTY OF ARTS

- CLST 501 through 517 are not offered each year. Consult the Department of Classics.
- 100 (6) Introduction to Classical Civilization – The history, literature, art, and architecture of fifth-century Athens and first-century Rome. Pertinent readings in translation and modern texts. [2-1; 2-1]
- 204 (3) Introduction to Classical Archaeology – A selective survey of the material cultures of the pre-classical and classical civilizations of the Mediterranean with emphasis on Italy, Greece, the Aegean, and Asia Minor, intended to illustrate the history, principles, aims, and techniques of classical archaeology and ancillary disciplines. (Also listed as ANTH 204.) [3-0]
- 210 (6) Greek Thought – A survey of Greek philosophy, science, and religion, given collaboratively by members of the Departments of Classics and Philosophy. The Presocratics; Plato; Aristotle; Stoicism; Epicureanism. (Also listed as PHIL 210.) [2-1; 2-1]

- 301 (3) The Technical Terms of Medicine and Biological Science – Acquaints the student with the Greek and Latin elements from which most specialized terms of modern medicine are constructed. Intended primarily for students planning to enter the medical, pharmaceutical, or biological sciences. (Not for credit toward the B.A. degree.) [2-1]
- 303 (3/6) d Life and Society in Classical Antiquity – Topics in Greek and Roman life and society, such as classical astronomy and ancient medicine. [3-0] or [3-0; 3-0]
- 305 (6) Classical Myth and Religion – The major cycles of Greek and Roman myth; their association with religion, cult, and society. [3-0; 3-0]
- 306 (3) Applied Science and Technology in Classical Antiquity – The origins and achievements of applied technology in the Greek and Roman world from the Bronze Age to late Antiquity, with special attention to archaeological evidence. [3-0]
- 307 (3) Greek Law – The study of Greek legal theory, practice, and institutions from their origin in self-help, through the early lawgivers and their codes, to the developed system of Athens in the fifth and fourth centuries. A variety of test cases from the works of the Greek orators will be explored. [3-0]
- 308 (3) Roman Law – The development of Roman private law during the classical period with special attention to family law, contract and delict. [3-0]
- 310 (6) Greek and Roman Literature – A study, through selected readings in translation, of the range and variety of literary forms invented and developed by the Greeks and Romans from Homer to Apuleius. [3-0; 3-0]
- 311 (3) Women in Antiquity: in Bronze Age, Classical Greek and Hellenistic Cultures – Women in Eastern Mediterranean cultures during 3 major periods of antiquity. The images projected in mythology, literature, and art are compared with the realities of women's lives insofar as they can be reconstructed from historical, legal, and archaeological records. [3-0]
- 312 (3) Women in Antiquity: in the Roman World of Republic – Women in the Roman world in the culture of the Republic and the Empire and in the Christian sub-culture of Late Antiquity. Literary, artistic, and mythological sources are compared and contrasted to historical, legal, and archaeological records. [3-0]
- 313 (3) Greek Epic – Homer's Iliad and Odyssey. In translation. [3-0]
- 314 (3) Latin Epic and Ancient Prose Fiction – Vergil's Aeneid, Ovid's Metamorphoses. Classical forerunners of the novel: Petronius' Satyricon, Apuleius' Golden Ass, Longus' Daphnis and Chloe, Heliodorus' Ethiopian Story. In translation. [3-0]
- 317 (3) Classical Tragedy – The plays of the Greek and Roman tragic dramatists. In translation. [3-0]
- 318 (3) Classical Comedy – The plays of the Greek and Roman comic dramatists: Aristophanes, Menander, Plautus and Terence. In translation. [3-0]
- 330 (6) Greek and Roman Art – A study of the achievements of the Greeks and Romans in art and architecture from the Bronze Age to the reign of Constantine. (Also listed as FINA 329.) [3-0; 3-0]
- 331 (6) 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 medieval world. No prerequisite. [3-0; 3-0]
- 332 (3/6) d The Roman Republic – A detailed study of Rome from the foundation to the Augustan settlement. The development of the constitution; the political system; acquisition and growth of Empire; the political, social, and economic consequences; the failure of the Republican

- system. Prerequisite: CLST 331 or permission of the instructor. [3-0] or [3-0; 3-0]
- 333 (6) The Roman Empire – A detailed study of Roman imperial history from 30 B.C. to the end of the fourth century. Attention will be directed to the development of Christianity and to the problem of Church and State. Prerequisite: CLST 331 or permission of the instructor. [3-0; 3-0]
- 334 (3/12) Problems in Greek History – This seminar will focus on selected problems in Greek history and historiography from the Bronze Age to the Hellenistic Period. Topics will be announced each year. Prerequisite: CLST 331 or permission of the instructor. [3-0; 3-0]
- 335 (6) Summer Practicum in Classical Archaeology – Practical training in excavation techniques and interpretation, including survey and mapping procedures, recording, drawing and analysis of artifacts, and study of comparative material. Students will participate in the excavation of a Greek or Roman site in Europe or the Middle East for the summer session. The course will include lectures and field-excursions relevant to the region and period of the site.
- 336 (3) Greek Philosophy and Literature from Homer to Sophocles – Major philosophical and literary ideas of the Archaic Age of Greece (750-440 B.C.). Recommended prerequisite: CLST 210 [3-0]
- 337 (3) Greek Philosophy and Literature in the Sophists, Plato and Aristotle. – The literature of the last third of the fifth century B.C. and selected works of Plato and Aristotle studied as evidence of the relation between Greek literature and philosophy, and as sources for theories of literature. Recommended prerequisite: CLST 336 [3-0]
- 429 (3/6) d Studies in the Art and Archaeology of Greece and Rome Prerequisite: CLST 330/FINA 329 or permission of the instructor. (Also listed as FINA 429.) [3-0; 3-0]
- 430 (3) Topography and Monuments of Ancient Athens – A study of the ancient city with special attention to the archaeological sources. Prerequisite: CLST 330/FINA 329 or permission of the instructor. [3-0]
- 431 (3) Topography and Monuments of Ancient Rome – A study of the ancient city with special attention to the archaeological sources. Prerequisite: CLST 330/FINA 329 or permission of the instructor. [3-0]
- 449 (6) Honours Essay
- 501 (3) Topography and Monuments of Athens – A study of the topography and monuments of ancient Athens from the Bronze Age to Late Antiquity. Offered in the first term of alternate years.
- 502 (3) Topography and Monuments of Rome – A study of the topography and monuments of ancient Rome from the Iron Age to Late Antiquity. Offered in the second term of alternate years.
- 503 (3/6) d Studies in Greek Architecture – Selected topics in Greek architecture, e.g., religious, secular, and military architecture.
- 504 (3/6) d Studies in Roman Architecture – Selected topics in Roman architecture, e.g., religious, military, domestic, and public secular architecture.
- 505 (3/6) d Studies in Greek Town Planning – The development of Greek town planning from the Bronze Age to the Hellenistic period.
- 506 (3/6) d Studies in Roman Town Planning – The origins of town planning in Italy and the development of cities in the Roman Empire.
- 508 (3/6) d Studies in Roman Painting and Mosaics – Selected topics in Roman painting and mosaics, e.g., Campanian wall painting, regional styles of mosaic decoration.
- 509 (3/6) d Studies in Greek Sculpture – Selected topics in Greek sculpture, e.g., development of kouros and kore, Hellenistic sculpture, sculpture of fifth-century Athens.
- 510 (3/6) d Studies in Roman Sculpture – Selected topics in Roman sculpture, e.g., imperial relief sculpture, portraiture, regional styles.
- 511 (3/6) d Studies in Greek Regional Archaeology – Study of a particular area, e.g., Ionia, Sicily, Southern Italy.
- 512 (3/6) d Studies in Roman Provincial Archaeology – Study of a particular area, e.g., Gaul, Britain, Asia Minor.
- 513 (3/6) d The Archaeology of Greek and Roman Technology – Material evidence for the technological achievements of the Greek and Roman world.
- 514 (3/6) d Greek and Roman Minor Arts – Minor arts of the Greek and Roman world, e.g., coins, jewellery, terracottas.
- 516 (3) d Studies in Greek Black Figure Vase Painting – Selected topics in Greek painting, e.g., Athenian vase painting, regional styles of vase painting, Hellenistic painting.
- 517 (3) d Studies in Greek Red Figure Vase Painting – Selected topics in Greek painting, e.g., Athenian vase painting, regional styles of vase painting, Hellenistic painting.
- 518 (3/6) Topics in Greek Archaeology.
- 519 (3/6) Topics in Roman Archaeology.
- 520 (3/6) Directed Studies in Greek Archaeology.
- 521 (3/6) Directed Studies in Roman Archaeology.
- 547 (0) Major Essay
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- Classics**
DEPARTMENT OF CLASSICS, FACULTY OF ARTS -
SEE CLASSICAL STUDIES, GREEK, LATIN
-
- Commerce** **COMM**
FACULTY OF COMMERCE AND BUSINESS
ADMINISTRATION
- In general, prerequisites are not listed in the Commerce course section of the Calendar. The required 200-level Commerce courses generally are prerequisite to 300-level and 400-level courses in the same option area. In each option, it is assumed that the required 300-level courses will be taken prior to the 400-level courses. Students should contact the Undergraduate Office for specific information about course prerequisites and variations from normal program sequences.
- 241 (3) Canadian Transportation – An introduction to the basic characteristics of the transport industry and to the issues in corporate and public policy decisions in transportation.
- 290 (3) Introduction to Quantitative Decision Making – Introduction to decision models in business. Basic Optimization, Linear Programming, Probability, Decision Analysis, Random Variables and Simulation.
- 291 (4) Application of Statistics in Business – Methods and applications of statistics in business; data analysis, descriptive regression; data generation; sampling distributions; hypothesis testing; confidence intervals; two sample problems; inference in regression. Prerequisite: COMM 290.
- 292 (4) Management and Organizational Behaviour – Behaviour in organizations as it affects people as individuals, their relationships with others, their performance in groups and their effectiveness at work.
- 293 (3) Financial Accounting – Introduction to the construction and interpretation of financial reports prepared primarily for external use.
- 294 (4) Managerial Accounting – Introduction to the development and use of accounting information for management planning and control and the development of cost information for financial reports. Problems in managerial accounting using spreadsheet tools. Prerequisite: COMM 293
- 295 (3) Managerial Economics – Economic foundations of managerial decision-making. Demand theory, cost and production, market structure, competitive strategy, organization of the firm, welfare-economic foundations of business regulation. Prerequisites: ECON 100, MATH 111 or their equivalents. Credit may be obtained for only one of ECON 201, ECON 206, AGEC 295, COMM 295.
- 296 (2) Introduction to Business and Management – Introduction to the basic concepts of management and administration; the internal operation of the enterprise; the relationship between the enterprise and the business environment; the analytical tools including computer literacy used in management.
- 297 (3) Capital Markets and Institutions – Economic environment in which business operates, including the role of the Bank of Canada; analysis of domestic and international money markets and institutions and the basic capital asset valuation models.
- 299 (1) Business Communications – Basic communication theory, communications in organizations. Includes written and oral practice in lab sessions.
- 306 (3) Urban Land Economics – (For Graduate Students only.) Urban growth and development, urban land values and land use, housing markets, urban transportation, local government, and land use regulation.
- 307 (3) Urban Land Economics – An introductory course which examines the economic factors affecting the urban land market. Emphasis on the determinants of urban land values, the housing market, urban transportation problems, and land use policies.
- 308 (3) Real Estate Investment Analysis – (For graduate students only.) Analysis of real estate investment markets, the optimal financing decision, risk return relationships, portfolio decisions, ownership forms and tax strategies.
- 309 (3) Real Estate Finance – The role of mortgage markets, mathematical analysis of return and valuation issues and methods of dealing with lender and borrower risk exposure. Prerequisite: COMM 297, 397.
- 310 (3) Simulation Models in Business Decision-Making – Computer simulation, simulation languages. Typical business applications in financial planning, waiting line problems and other operating problems.
- 311 (3) Decision Analysis I – (For Graduate students only.) Quantitative methods such as decision analysis, mathematical programming and introductory probability theory as applied to business problems.
- 312 (3) Decision Analysis II – (For Graduate students only.) The theory and use of statistics in business. Hypothesis testing, regression analysis, estimation.
- 313 (2) Quantitative Methods Analysis – (For Graduate students only.) Theory and applications of basic mathematics and calculus to business problems.
- 320 (3) Organizational Analysis – An analysis of organizational structures and intraorganizational processes; effects of organizational factors on individual behaviour. Prerequisite: COMM 292.
- 323 (3) Human Resources Management I – (For Graduate students only.) Provides overview of the management of individuals, groups and organizations in the absence and presence of labour unions. Deals with the functions of management relating to human resources.
- 326 (2) Human Resources Management II – (For Graduate students only.) Managerial functions with special emphasis on labour relations, related issues and managerial skills.
- 327 (3) Research Methods for Human Resource Management – Problems related to the collection of data within organizations to support changes in personnel policies and practices. Basic principles of scaling, experimental and quasi-experimental design and research ethics. Prerequisite: COMM 292.
- 328 (3) Administration of Collective Agreements – Grievance handling in collective agreements; the arbitration process; arbitral jurisprudence; substantive grievance issues such as discipline and promotions. Prerequisite: COMM 392.

- 329 (3) Principles of Organizational Behaviour – An introductory examination of work organizations and the behaviour of individuals within them. Phenomena to be studied include organizational structure, environments, group processes, motivation and leadership. (For non-Commerce students in 3rd and 4th year.)
- 330 (3) Topics in Business Law – (For Graduate students only.) Selected topics illustrate the interplay between the law and the business environment. Emphasis will be on the theoretical framework in which laws are developed and applied to commercial transactions.
- 335 (3) Information Systems Technology and Development – Introduction to information technology related to business use. Design, implementation and application of Information Systems. Prerequisite: COMM 391 or CPSC 216.
- 336 (2) Information Systems for Management – (For Graduate students only.) Introduction to information systems concepts for managers. Use of modern information technology by individuals, groups and organizations. Inter-organizational information systems. The role of information systems as an element of corporate strategy.
- 341 (3) Business Logistics – The role of logistics in marketing, production and corporate strategy. Methods and practice in the integration of transportation, inventory control and other distribution functions.
- 342 (3) Transportation Policy – (For Graduate students only.) Introduction to the economics and analyses of transportation as a basis for policy in transportation companies and government, and as a background to the role of transportation in business logistics.
- 349 (3) Transportation Management I – Introduction to transportation with emphasis on management decision-making for marketing, operations and labour relations. Cases are drawn from all modes of transportation.
- 351 (3) Financial Accounting – (For Graduate students only.) A study of basic accounting concepts and methods; an examination of current principles and practices relating to published financial statements from the point of view of decision makers external to the firm.
- 352 (3) Managerial Accounting – (For Graduate students only.) An examination of accounting for management planning and control, including cost accounting, budgeting, accounting control systems, and use of accounting information in management decisions.
- 353 (3) Financial Accounting - Intermediate I – An examination of accounting as a means of measurement and as an information system for external reporting purposes. Prerequisite: COMM 293, 294.
- 354 (3) Cost Accounting – The provision and analysis of cost accounting information that will assist management in making operating decisions and in evaluating operational performance. The utilization of statistical analysis and linear models is included. Prerequisite: COMM 293, 294.
- 355 (3) Income Taxation – A study of income tax from the standpoint of the individual and of business enterprise.
- 357 (3) Tax Planning
- 361 (3) Marketing Management – (For Graduate students only.) Methods of analysis and strategic concepts applied to the problems of product selection, distribution, promotional activities, pricing and market research. The managerial decision focus typically employs analyses of cases drawn from a variety of organizations.
- 362 (3) Consumer Behaviour – The use of consumer research and theory in marketing and policy decisions. Psychological, sociological and economic theory and research relevant to consumer behaviour are considered. Prerequisite: COMM 396.
- 363 (3) Marketing Analysis – Analytical methods applicable to marketing management decision making; attention to strategic considerations linking analysis of consumer data, corporate data, environmental factors, and competitive response. The course makes extensive use of micro computers. Prerequisite: COMM 391, 396.
- 364 (3) International Marketing – 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.
- 365 (3) Marketing Research – The process of marketing research including topics such as problem/opportunity formulation, research objectives, data sources, research instrument design, sampling, data collection and processing and methods of data analysis. Prerequisite: COMM 290, 291, 391, 396.
- 366 (3) Marketing Research Problems – The application of research methods to problems in marketing.
- 371 (3) Theory of Finance – Basic concepts of corporate finance, including security valuation and financial decisions by the corporation. Prerequisite: COMM 397.
- 373 (3) Business Finance – (For Graduate students only.) The major financial decisions that businesses face; the analytical approaches that are available to assist with these decisions; and the links between these decisions, and the financial community.
- 374 (3) Security Markets – Introduction to theories and evidence concerning the structure of security markets and the valuation of stocks, bonds, options, and futures contracts; the role of portfolio management in informationally efficient security markets. Prerequisite: COMM 397.
- 376 (3) Financial Institutions I – The financial systems in Canada; the practices of the major financial institutions; and theories of financial processes.
- 377 (3) International Financial Markets and Institutions – Structure, nature and institutions of foreign exchange markets, private including spot, forward, futures, options, and offshore currency markets. Factors affecting effects of exchange rates on the firm. Prerequisite: COMM 397.
- 378 (3) Risk Management Insurance – Management of personal and business risk. The insurance mechanism, life and non-life insurance, group benefits, pensions and social security. Prerequisite: COMM 397.
- 379 (3) Fundamentals of Actuarial Science – Actuarial methods, life contingencies. Introduction to insurance and pension mathematics. Determination of premiums and reserves. Valuation of assets and mathematics. Rate-making. Prerequisite: COMM 378 or permission of instructor.
- 381 (3) Industrial Organization – (For Graduate students only.) A survey of the management functions involved in establishing and operating a business with particular reference to manufacturing.
- 383 (3) Production/Operations Management – Production planning and scheduling, inventory control, control of materials, purchasing, quality assurance, capacity management and industrial location decisions.
- 388 (3-6) d Current Issues in Arts Administration
- 391 (3) Introduction to Management Information Systems – Overview of computer technology and terminology; use of computers as managerial and administrative tools; the management of computer resources and the influence of information technology within the organization.
- 392 (3) Labour Relations – Management of employment relations as conducted through collective bargaining and trade unions. Emphasis on public policy, negotiation processes, and dispute resolution.
- 393 (3) Commercial Law – Introduction to the law of contracts, with particular reference to contracts for sale of goods and related law of personal property; principles of agency, partnerships and company law.
- 394 (4) Government and Business – Roles of government and business in the Canadian economy including effects of public policy on the business environment. Ethical foundations of government, business and personal decision-making.
- 396 (4) Introduction to Marketing – Basic considerations affecting the domestic and international marketing of goods and services.
- 397 (3) Business Finance – Examination of the corporate enterprise decisions including working capital management, capital budgeting; capital structures and dividend policy. Prerequisite: COMM 297.
- 399 (3) Logistics and Operations Management – The design and operation of systems to make products, provide services and deliver them to the end user.
- 400 (3-36) d Study Abroad – A one or two term program of regular undergraduate studies at a foreign university under an existing formal exchange program.
- 406 (3) Urban Public Economics – The economics of local government. Analysis will focus on local expenditures, taxes, and land use control including the impacts of these policies. Prerequisite: COMM 307.
- 407 (3) Real Estate Valuation – Application of modern techniques to the estimation of property value, to mass appraisal, and the development of price indices. Prerequisite: COMM 309.
- 408 (3) Real Estate Investment Analysis – Analysis of real estate investment markets, impact of financing on equity markets, managing the risk-return relationship, and analyzing real property in the context of mixed portfolios. Prerequisite: COMM 407.
- 409 (3) City Growth and Structure – Advanced urban and regional economics, including economic basis analysis location theory, housing policy, dynamics of land use, land use succession, and urban renewal. Prerequisite: COMM 307.
- 410 (3) Methods of Management Science – Formulation of models from a variety of areas, including the analysis of models of inventory, allocation (linear and non-linear programming), competition (game theory), and scheduling. Case studies will be used.
- 411 (3) Intermediate Business Statistics – Statistical techniques useful in business environments. Includes regression analysis, analysis of variance, forecasting, and logit and probit analysis. Credit may be obtained for only one of STAT 300, 306, and COMM 411.
- 420 (3) Advanced Topics in Organizational Behaviour – Human behavioural processes and their effects on individual behavior in organized work settings. Topics may include social comparison, frustration, power, stratification, and attribution processes. Prerequisite: COMM 292.
- 421 (3) Collective Bargaining – Structural, behavioural, legal and substantive aspects of labour management relations and the collective bargaining process. Prerequisite: COMM 392.
- 422 (3) Public Sector Industrial Relations – Industrial relations in the Canadian public sector and the experience of the parties in dealing with these issues. Studies of subsectors such as civil services, education and health care are undertaken. Prerequisite: COMM 392.
- 426 (3) Organizational Development – The tactics and strategies for implementing constructive modifications in organizations. Interpersonal relations skill building is emphasized in classroom activities, while lectures and assignments explore applications in business and non-business organizations. Prerequisite: COMM 292.
- 427 (3) Personnel and Human Resource Management I – Activities, policies and practices required for effective human resource planning, external factors that influence human resource functions and the recruitment, selection and assignment of personnel. Prerequisite: COMM 327.
- 428 (3) Personnel and Human Resource Management II – Training and development, performance appraisal and career management. Prerequisite: COMM 327.

- 431 (3) Law of Business Associations – The application of various statutes to business entities including corporations, partnerships, societies, co-operatives, credit unions, trust companies and banks; the consequences of bankruptcy on legal entities. Prerequisite: COMM 393.
- 433 (3) Employment Law – Legal aspects of the employment relationship. Topics include: employment contracts, human rights legislation, standards of work legislation, the labour codes, Workers' Compensation Act and statutes dealing with related areas, e.g., unemployment and pension benefits. Prerequisite: COMM 393.
- 434 (3) Land Law – Legal principles and concepts relating to real estate and land development. Prerequisite: COMM 393.
- 436 (3) Information Systems Analysis and Design – The process of information systems development; Modern techniques and tools for systems analysis and design. Prerequisite: COMM 335.
- 437 (3) Database Technology – Theory and technology of database management from an applications perspective; database design; database administration. Prerequisite: COMM 391 or COMM 335. Credit will not be granted for both COMM 437 and CPSC 404.
- 438 (3) Management of Information Systems – Managerial issues in the administration of computerized information systems. Prerequisite: COMM 391 or COMM 436.
- 439 (3) Advanced Topics in Management Information Systems – Application of modern information technology in organizations and its implications to organizational and inter-organizational activities. Prerequisite: COMM 436 (may be taken concurrently) and one of COMM 437 or CPSC 404.
- 441 (3) Advanced Business Logistics – Analysis of logistics systems within firms and across supply chains. The formulation of corporate logistics strategies. Prerequisite: COMM 399.
- 444 (3) Air Transportation – An integrative treatment of airline management recognizing the particular economic features of the industry, and the domestic and international legal and regulatory regimes under which the carriers operate.
- 445 (3) Shipping and International Logistics – The characteristics of shipping services and the role of shipping services in the design and management of international logistics systems.
- 447 (3) Urban Transportation and Project Appraisal – Economic issues in providing urban transportation services including cost of alternate systems, demand analysis and impact assessment. Project appraisal and financial problems.
- 449 (3) Transportation Management II – Problems in transportation management including demand and cost analysis, integrated service and pricing strategies, and operations design and control. Prerequisite: COMM 349.
- 450 (3) Financial Accounting – Intermediate II Continuation of the examination of accounting as a means of measurement and as an information system for external reporting purposes. Prerequisite: COMM 353.
- 451 (3) Advanced Accounting Topics – Selected areas in accounting.
- 452 (3) Income and other Taxes – A study of advanced income tax topics; consideration of tax provisions and tax burdens in selected foreign countries; an examination of selected B.C. taxing statutes. Prerequisite: COMM 355.
- 453 (3) Financial Accounting Advanced – An examination of advanced financial accounting. Prerequisite: COMM 353, 450.
- 454 (3) Advanced Management Accounting – Design of management planning and control systems, including an analysis of the impact of investment project evaluation, information asymmetries, decentralized organizational structures and design of management incentive schemes. Prerequisite: COMM 354.
- 455 (3) Principles of Auditing – Principles of internal control, audit evidence, sampling and testing; audit reports; standards; responsibilities of the external auditor. Prerequisites: COMM 353, 450.
- 456 (3) Computer Audit, Security and Control – Audit, security and control implications of computer-based management information systems.
- 457 (3) Introduction to Financial Accounting – Financial accounting for business organizations; principles and problems of accounting measurements; forms of business organizations; financing of businesses. (For non-Commerce students in 3rd or 4th year only.)
- 458 (3) Introduction to Managerial Accounting – Use of accounting data in decision making by businesses; financial statement analysis; cash flows; cost behaviour patterns; methods of accounting for costs. (For non-Commerce students in 3rd and 4th year only.) Prerequisite: COMM 457.
- 459 (3) Financial Statement Analysis – An examination of the uses of financial statement information in business decisions.
- 460 (3) Public and Nonprofit Marketing Management – Examines the role, use, and application of marketing in government agencies and nonprofit institutions.
- 461 (3) Sales Management – Theory and management of personal selling. Strategy, tactics, and implementation of sales programs.
- 462 (3) Promotion Problems – Campaign strategy; planning, organizing, and controlling an advertising program; advertising research and analysis. Prerequisite: COMM 362.
- 463 (3) Institutional Marketing Problems – An investigation of current developments in both retailing and wholesaling fields and their application to marketing institutions.
- 464 (3) Selected Topics in Marketing
- 465 (3) Introduction to Marketing – Basic considerations affecting the domestic and international marketing of goods and services. Prerequisites: ECON 100, COMM 457 or equivalent. (For non-Commerce students in 3rd and 4th year only.)
- 466 (3) Industrial Marketing Problems – Managerial problems in marketing industrial products, services, and commodities; problem analysis of producer goods and specialized channels of distribution.
- 467 (3) Marketing Strategy – Strategic marketing analysis; product, communications, pricing and distribution strategies; and governmental regulation of marketing processes. Prerequisites: COMM 362, 363.
- 468 (3) Marketing Management Applications – Applied marketing planning with emphasis on a major industrial analysis and the subsequent development of a detailed marketing plan for an operating organization. Prerequisites: COMM 362, 363.
- 469 (3) 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 multinational branches and subsidiaries. Prerequisite: COMM 396.
- 471 (3) Financial Management – Advanced problems of financial management. Debt policy and capital structure planning; capital costs, capital budgeting, dividend policy, valuation, mergers and acquisitions. Prerequisite: COMM 397.
- 472 (3) Quantitative Analysis of Financial Decisions – Application of modern quantitative techniques to the formulation of financial decisions under conditions of both certainty and uncertainty. Prerequisite: COMM 371.
- 475 (3) Investment Policy – The management of security portfolios for individual and institutional investors; relation of investment policy to money markets and business fluctuations. Prerequisite: COMM 374.
- 478 (3) International Financial Management – International financing, hedging and investment activities. Sources of funds, asset pricing, bond markets, equity markets and capital budgeting. Topics include working capital management, financial control, transfer prices, taxation, and growth of multi-n. Prerequisite: COMM 377.
- 483 (6) Planning and Control Problems – Advanced problems in planning and controlling work operations with special emphasis on quantitative analysis. Case and field work problems.
- 488 (3) Public Sector Management – This course focuses on some of the distinctive aspects of managing in the public sector.
- 489 (3) Topics in Policy Analysis and Public Policy – Current developments in the theory and practice of policy analysis applied to specific issues in the public and private sectors.
- 490 (3/6) Directed Studies in Commerce – An investigation and report on a topic to be agreed upon by a member of the faculty and a senior student.
- 491 (3) Strategic Management – Concepts and processes for the strategic management of private sector, single and multi-business unit enterprises are analysed using the case method. Methodologies which draw on economic and organizational theory are integrated to form the foundations for strategic analyses.
- 492 (3) Management Simulation – Student teams manage hypothetical firms in a complex simulation, coordinating production, finance, marketing and strategic planning in competition with other teams.
- 494 (3) Corporate and Industry Analysis – A general framework for the analysis of industries for the purpose of shaping corporate strategy and public policy. Focuses on market structure, the conduct of firms and industry performance.
- 497 (3) New Enterprise Development – The particular problems and experiences encountered in starting, developing and managing new enterprises. The course includes lectures, guest speakers, and case studies.
- 498 (3) International Business Management – Development of general environmental framework for international business studies by drawing on international and development economics, research into government-business relations and studies in comparative socio-cultural systems and political systems.
- 499 (3/6) Internship
- 500 (3/30) Study Abroad –
- 503 (3) Seminar in Housing Economics
- 504 (3) Seminar in Property Taxation
- 505 (3) Seminar in Urban Land Economics
- 506 (3) Seminar in Real Estate Development
- 507 (3) Seminar in Real Estate Investment
- 508 (3) Seminar in Urban Public Economics
- 509 (3) Seminar in Mortgage Financing
- 510 (3) Seminar in Production
- 511 (3) Seminar in Business Applications of Management Science I
- 513 (3) Computer Applications in Management Science, I
- 515 (3) Foundations of Optimization
- 517 (3) Discrete Optimization, I
- 520 (3) Advanced Topics in Organizational Behaviour
- 521 (3) Personnel/Human Resource Administration
- 522 (3) Management of Labour Relations
- 523 (3) Selected Problems in Labour Relations
- 524 (3) Organizational Change and Development

- 525 (3) Methodology of Organizational and Human Resource Management Research
- 526 (3) Corporate Reorganizations
- 527 (3) International and Comparative Labour Relations
- 528 (3) Advanced Topics in Human Resource Management
- 529 (3) Organizational Analysis, Internal Power and Politics
- 533 (3) User-Oriented Information Technology
- 534 (3) Developing Information Systems
- 536 (3) Analysis and Design of Information Systems
- 537 (3) Data Base Design and Administration
- 538 (3) Administration of Computerized Information Systems
- 539 (3) Technology Strategy and Policy
- 541 (3) Logistics Systems Analysis
- 544 (3) Seminar in Transportation Economics
- 545 (3) Project Evaluation and Management
- 546 (3-6) d Selected Topics in International Business
- 547 (0) MBA Major Essay
- 548 (3) Directed Study in Business Administration
- 549 (6/12) c Masters Thesis
- 550 (3) Seminar in Financial Statement Analysis
- 551 (3) Advanced Accounting Seminar
- 552 (3) Seminar in Income Determination
- 553 (3) Seminar in Accounting Standards
- 556 (3) Seminar in Management Accounting
- 557 (3) Seminar in Taxation
- 561 (3) Law and the Arts
- 562 (3) Marketing Strategy
- 563 (3) Marketing for Industrial Operations
- 564 (3) Consumer Behaviour Seminar
- 565 (3) Seminar in Market Analysis
- 566 (3) Seminar in International Marketing
- 568 (3) Seminar in International Business
- 569 (3) Marketing Management in Public and Nonprofit Organizations
- 571 (3) Seminar in Financial Management
- 572 (3) Advanced Theory and Quantitative Techniques in Corporate Finance
- 574 (3) Seminar in Security Analysis
- 575 (3) Seminar in Investment Management
- 576 (3) Seminar in Financial Institutions
- 577 (3) Seminar in International Finance
- 578 (3) International Financial Management
- 579 (3) Seminar in Risk Management and Theory
- 580 (3) Business Statistics
- 581 (3) Statistical Methodology, I
- 582 (3) Statistical Methodology, II
- 583 (3) Forecasting and Time Series Analysis in Business Environments
- 585 (3) Applied Stochastic Processes, I
- 586 (3) Dynamic Programming and Stochastic Control
- 588 (3) Public Policy Analysis and Management
- 589 (3) Entrepreneurship and New Venture Creation
- 590 (3-9) Topics in Business Administration
- 591 (3) Management Strategy and Policy
- 592 (3) Management Simulation
- 593 (3) Corporate Planning Models
- 594 (3) Business, Government and Society
- 595 (3) Energy Policy and Management
- 596 (3) Managerial Decision-Making
- 598 (3) Analysis of the International Business Environment
- 599 (3/6) d Selected Topics in Policy Analysis
- 604 (3) Advanced Topics in Urban Land Economics I
- 605 (3) Advanced Topics in Urban Land Economics II
- 609 Seminar in Urban Land Economics
- 611 (3) Seminar on Theoretical Developments in Management
- 612 (3) Advanced Topics in Optimization
- 616 (3) Optimization Theory and Applications
- 618 (3) Discrete Optimization, II
- 625 (3) Micro-Level Organizational Behaviour
- 626 (3) Seminar in Organizational Theory
- 628 (3) Organizational Behaviour Research Seminar
- 634 (3) Research Seminar in Management Information Systems
- 635 (3) Advanced Topics in Management Information Systems
- 636 (3) Workshop in Management Information Systems
- 643 (3) Workshop in Transportation and Utilities
- 644 (3) Advanced Topics in Transportation
- 649 Ph.D. Thesis
- 651 (3) Analysis of Accounting Information in Markets
- 654 Analysis of Accounting Information in Organizations
- 658 (3) Research Seminar in Accounting
- 659 (3) Directed Studies in Accounting and Information Systems
- 660 (3) Research Seminar in Marketing
- 661 (3) Analytical Methods and Models
- 662 (3) Buyer Behaviour
- 671 (3) Theory of Finance
- 672 (3) Advanced Topics in Theoretical Corporate Finance
- 673 (3) Advanced Topics in Theoretical Asset Pricing
- 674 (3) Advanced Topics in Empirical Asset Pricing
- 675 (3) Research Seminar in Finance
- 682 (3) Advanced Topics in Stochastic Models
- 684 (3) Topics in Advanced Business Statistics
- 691 (3) Advanced Topics in Policy Analysis
- 692 (3) Research Seminar in Policy Analysis
- 693 (3) Seminar in Research Methodology I
- 695 (3) Advanced Topics in Empirical Corporate Finance and Accounting
- 696 (3) Applied Research in Policy Analysis and Strategy
- 697 (3) Organizational Decision-Making
- ing role of government in the development of Canadian communities during this century.
- 502 (3) Planning Theory – Historical and contemporary concepts of the planning process and its legitimacy. The role of the state, public interest, and the responsibilities of professional planners. Concepts and codes of professional ethics.
- 503 (3) Planning for Community Economic Development – Theories of community economic development planning. Concepts of community wealth, income, growth and development. Models of the formal and informal community economy.
- 504 (3) The Ecological Context of Planning – A planning-oriented approach to ecosystems theory emphasizing the structural and functional properties of the biophysical environment. Definition of the urban-centered region in terms of interregional flows and ecological accounts.
- 505 (3) Community Development Planning – Evolution of development theory emphasizing the changing relationships among community, state and individuals. Development paradigms and alternative concepts of community.
- 506 (3) The Legal Context of Planning – Legal principles affecting the administration of planning programs including the meaning and sources of the law, the separation of the functions of government, the Canadian Constitution and Charter of Rights and Freedoms, the law of Canadian municipal corporations, natural resource law, the nature and control of administrative action, judicial review of discretionary power, and the drafting of legislation.
- 507 (3) Regional Development Planning – Origins, theory, and practice of planning for regions in Canada and abroad. Types of planning regions, institutional forms for regional planning, regional disparities, and approaches to regional analysis. Resource frontiers, urban, amenity, and rural regions provide the policy context.
- 510 (3) Computers in Planning – Application of computer programs to planning practice, including the integration of databases, spreadsheets, and graphics. (Graded on a pass-fail basis.)
- 511 (3) Quantitative Reasoning and Statistics for Planning – Research design and statistics for the analysis of empirical issues in planning and policy studies.
- 512 (3) Demographic Forecasting for Planning. – Techniques of projection: mathematical extrapolations; comparative methods; cohort-survivor model; migration model.
- 513 (3) Economic Impact and Evaluation for Planning – Topics include economic base, income-expenditure, input-output, computer simulation, cost-benefit, goals achievement matrix and the planning balance sheet.
- 514 (3) Impact Analysis for Planning – A planning-oriented approach to environmental impact assessment emphasizing institutional, procedural and methodological issues. The conceptual and systemic relationship among biophysical, social and economic impact assessment and the evolving relationship with community development planning.
- 515 (3) Data for Planning Practice – Data collection and analysis in relation to professional practice and the scientific method. Questionnaire surveys and alternatives including secondary analysis, unobtrusive measures and client participation techniques.
- 540 (3-12) d Planning Project – Group preparation and presentation of a professional report.
- 545 (3/6) d Planning Studies Abroad – An extended site visit outside Canada to understand the cultural context for community and regional planning issues and the local institutional response.
- 548 (1-12) d Current Issues in Planning – Each year the school may offer one or more courses on a topical issue covering recent advances in the field.
- 549 (6-12) c Master's Thesis – Research and preparation of a thesis on a topic in public policy or professional practice.

Community and Regional Planning

PLAN

FACULTY OF GRADUATE STUDIES

- 425 (3) Urban Planning Issues and Concepts – Evolution, practice and future of urban planning and development, with emphasis on institutional arrangements, housing, transportation, urban design and development control. For third- and fourth-year undergraduate students interested in urban planning. Prerequisite: URST 200, or COMM 306, or GEOG 350, or permission of the instructor. [3-0; 0-0]
- 500 (3) Fundamentals of Planning Practice – The design and use of problem-solving procedures. The effective leadership of planning groups, and the development of appropriate community planning processes. Styles of public participation.
- 501 (3) History of Community and Regional Planning – The origins and evolution of modern urban and regional planning in North America and Europe, emphasizing the chang-

- 550 (3-12) c Directed Studies – In special cases and with the approval of the Director of the school, a student may study an advanced topic under the direction of a faculty member.
- 560 (3) Introduction to Real Property Development and Plan – Theoretical and practical aspects of analyzing and forecasting urban development trends and patterns.
- 561 (3) Seminar in Real Property Development and Planning – Topics will vary.
- 565 (1-12) d Current Issues in Real Property Development and Planning – Topics will vary.
- 570 (3) Urban Planning in Developing Countries – Policies concerning basic needs and poverty alleviation focusing on infrastructure.
- 571 (3) Housing Policy and Practice in Cities of the Developing World – Housing development and government policy in cities of developing countries.
- 572 (3) Project and Program Design in Developing Asian Countries – Development theories, the role of the state, the importance of political and social contexts, and the influence of foreign planning models.
- 573 (3) Shelter and Services in Developing Countries – Human settlements paradigm in international development, especially in relation to urban poverty and enabling strategies.
- 574 (3) Urban Design in Developing Asian Countries – Appropriate socioeconomic and cultural urban forms, heritage and environmental conservation, sustainable urban environments, and the methods of implementing urban design policy.
- 575 (3) International Development Planning Seminar – Topics will vary.
- 579 (3) Microcomputers in Transportation Planning – The use of microcomputers in urban transportation planning. Focus is on practical problem solving and forecasting.
- 580 (3) Urban Transportation Planning – Topics include the relationship between transportation and urban activity systems; analysis of supply and demand; accessibility and environment; institutional arrangements and public finance.
- 581 (3) Urban Infrastructure Planning and Development – Policy considerations in the provision of infrastructure including the legal framework, institutional arrangements, and public finance. Planning considerations in drainage, waterworks, sewerage and waste management.
- 582 (3/6) d Residential Site Planning Studio – Evaluation of neighbourhoods and projects, site analysis, housing types and densities, provision of community facilities and services, and the design of site plans.
- 583 (3) Housing and Community Planning – The social, economic, political and land use dimensions of Canadian housing in the context of demographic trends, housing demand and affordability. Recent trends in housing policy and the role of the public and private sectors in housing supply.
- 584 (3) Neighbourhood Planning – Concept of neighbourhood including theories of land use, social behaviour and urban economics. Public policy options for the formulation of local area plans.
- 585 (3) Housing Seminar Prerequisite: PLAN 583.
- 586 (3) Gender and Planning – Analysis of women's dual roles as users and creators of built environments and the comparative roles of men and women.
- 587 (3/6) c Urban Design – A studio/seminar on the history of the physical form of cities and theories of city design. Topics include social impacts, heritage and environmental conservation, urban revitalization, and the legal and administrative instruments for the implementation of city designs.
- 588 (3) Social Aspects of Urban Form – Exploration of how the urban built environment has been shaped by the actors in the development process.
- 589 (3) Influencing the Policy Process – The evolution of policies through the legislative, regulatory and bureaucratic processes with an emphasis on the federal and provincial governments.
- 590 (3/6) c Public Policy and Urban Planning – Development of public policy in theory and practice. The impact of federal, provincial and local government policies on urban and regional planning. Exercises in policy making and documentation.
- 591 (1-3) d Contemporary Perspectives on Planning Law – Legal methods, institutional and administrative arrangements for the implementation of urban plans including control of land use, subdivision, aesthetics, building construction and advertising. Legal means for historic and scenic preservation. Expropriation and public land development. Problems in intergovernmental jurisdiction. Prerequisite: PLAN 506.
- 592 (3) Urban Restructuring – The determinants of urban restructuring, including emerging theoretical perspectives and case studies of Canadian and foreign cities.
- 593 (3) Resource Analysis for Regional Planning – An ecological approach to land use and resource analysis for regional planning covering inventory, classification, and alternative methods of analysis.
- 594 (3) Perspectives on Natural Resources Planning – Alternative economic, institutional, environmental, political, cultural, and ecological perspectives on natural resources planning.
- 595 (3) Planning and Negotiation in Natural Resources Management – Institutional structures for policy development and implementation.
- 596 (3) Seminar on Environmental-Economic Systems – Relationships between economic activity and the biophysical environment. Topics include the assumptions and determinants underlying economic growth, market failure and traditional approaches to public intervention, the implications of alternatives such as the steady-state economy and sustainable development. Prerequisite: PLAN 504.
- 597 (3) Planning for Water Resources Management – The relationships among relevant bio-physical, socio-economic and institutional systems as applied to regional planning for watersheds, lakes, estuaries, coastal zones and international river basins. Water supply, waste disposal, fisheries, aquaculture, recreation, hydropower and flood control.
- 598 (3) Seminar in Regional Development Planning Prerequisite: PLAN 507.
- 599 (3) Environmental Policy Analysis – Determination of risks and values in environmental policy decisions.
- 601 (3) Research Methods Seminar
- 602 (3) Planning Theory Advanced Seminar.
- 603 (3) Ph.D. Colloquium.
- 649 Ph.D. Thesis

Comparative Literature COML
FACULTY OF GRADUATE STUDIES. SEE ALSO
COMPARATIVE LITERATURE UNDER PROGRAMS IN
THE FACULTY OF ARTS

- 500 (3/6) d Introduction to Comparative Literature
- 501 (3/6) d Studies in Genre
- 502 (3/6) d Studies in Literary Movements and Periods
- 503 (3/6) d Studies in Myth, Theme and Tradition
- 504 (3/6) d Topics in Comparative Literature
- 505 (3/6) d New Problems in Comparative Literature
- 506 (3/6) d Comparative Studies in Oriental and Occidental Literature
- 507 (3/6) d Advanced Seminar in Literary Criticism
- 547 (3-12) c Reading Course
- 549 (6/12) c Master's Thesis
- 649 Ph.D. Thesis

Computer Science CPSC
FACULTY OF SCIENCE

*For students in the Faculty of Applied Science

**Additional fees are charged for these courses. See Index "Fees - Special Fees"

Note: Students wanting a comprehensive introduction to Computer Science as a discipline should take CPSC 124 and 126 or CPSC 122 and 128. CPSC 124 alone is not recommended. CPSC 100 is intended for students who do not plan to pursue degree programs in the Department of Computer Science. Students may not obtain credit for more than one of CPSC 100, 122, 124 and 152. Consult the Department for further information.

- 100 (3) Elements of Computer Science – An introduction to computer applications and programming. Fundamental computer concepts; programming; history, structure, and social implications of computers. Credit will be given for only one of CPSC 100, 111, 114, 124, 151 and 152. [3-3-1; 0-0-0] or [0-0-0; 3-3-1]
- 122 3 Principles of Computer Programming – Systematic study of algorithms and data structures using an object-oriented programming language. Introduction to the foundations of computer science. Prerequisite: MATH 100 (may be taken concurrently). Credit will be given for only one of CPSC 122 and 124. [3-3-1]
- 124 (3) Principles of Computer Science I – Mathematical introduction to computer science, including procedural and data abstraction, and an introduction to program design methodology. This course is normally followed by CPSC 126. Computer Science 12 (provincial) is helpful. Prerequisite: MATH 100 (may be taken concurrently). [3-3-1; 0-0-0]
- 126 (3) Principles of Computer Science II – Mathematical introduction to computer science, including models of computation, program design methodology, computer organization and compiling. The sequences CPSC 124/126 or CPSC 122/128 are the intended prerequisite for advanced study in Computer Science. Credit will not be given for both CPSC 126 and 128. Prerequisite: CPSC 124. [0-0-0; 3-3-1]
- 128 (3) Principles of Computer Science - Mathematical introduction to computer science, including procedural and data abstraction, program design methodology, models of computation, computer organization, and compiling. This course covers topics from CPSC 124/126 not included in CPSC 122. Credit will not be given for both CPSC 126 and 128. Prerequisites: CPSC 122. [3-3-1; 0-0-0]
- 152* (3) Principles of Software Development – An introduction to the principles underlying the design and testing of software, using the Fortran and Pascal languages. Program design: types, variables, procedures; control structures: arrays, records, and other data structures; recursion. Program testing. Prerequisite: 3 credits of first-year Mathematics (may be taken concurrently). Credit will be given for only one of CPSC 100, 111, 114 (no longer offered), 124, 151 (no longer offered) and 152. [3-2-1; 0-0-0] or [0-0-0; 3-2-1]
- 216 (3) Program Design and Data Structures – Introduction to techniques for designing and implementing programs of intermediate complexity. Program design methodology, especially object-oriented programming. Programming environments. Data structures, especially graphs and trees. Algorithms for searching and sorting. Students will undertake a programming project. Prerequisite: CPSC 126 or 128. Credit will not be given for both CPSC 216 and ELEC 314. [3-2-1; 0-0-0] or [0-0-0; 3-2-1]
- 218 (3) Computer Organization – Overview of computer organization. Sequential and combinational circuits. Finite-state machines. Microinterpreters and microprogramming. Stack and register machine languages. Memory hierarchies. Processes. Prerequisite: CPSC 126 or 128. Credit will be given for only one of CPSC 218 and ELEC 259. [3-2-1; 0-0-0] or [0-0-0; 3-2-1]

DigiPen Applied Computer Graphics School

Program Offered: THE ART AND SCIENCE OF 2D AND 3D VIDEO GAME PROGRAMMING,
A SUPER NINTENDO ENTERTAINMENT SYSTEM® GAME PROGRAMMING COURSE.

Program Objectives:

To offer a unique and complete program teaching the art and science of game programming. There is no educational program available in North America to train students in this subject. DigiPen trains students in a logical and sequential method incorporating its unique experience in computer science coupled with computer animation. DigiPen offers the program with the cooperation of Nintendo of America Inc., whose expertise and success in the field of video games will also be of great benefit to the students. We believe that the cooperation between Nintendo and DigiPen will help make DigiPen's graduates more employable on both national and international levels.

Student Profile and Prerequisites:

Students must be enthusiastic and creative with a will to learn the complex worlds of computer and video game programming and its relation to virtual reality.

- Students must have completed Grade 12 or equivalent.
- Students may be required to take the entrance examination of our institution.
(Students who have a B average or higher in their Grade 12 Math may be exempt from the entrance examination.)
- Students must also pass the screening of our advisory committee.

Length of the Program: The Program is two full years (summers included), making it an intensive program.

Curriculum

The First Year:

The first year is the Foundation Year. It is divided into two semesters and a summer workshop:

- Semester I: Foundation
- Semester II: High Level Programming
- Summer Workshop I: Practical High Level Programming Workshop

The Second Year:

The second year is the Production Year. It is divided into two semesters and a summer workshop:

- Semester III: Low Level Programming
- Semester IV: Implementation of a Game on the Super NES
- Summer Workshop II: Overload of Semester IV

Completion:

To pass the first and second year:

Students must complete all required assignments and class work with an average of 50% or more, and maintain a minimum of 70% attendance during each year.

Program Offered: THREE DIMENSIONAL COMPUTER GRAPHICS AND ANIMATION PROGRAM

Program Objectives:

To offer a complete program that teaches the fundamentals of 3D Computer animation production and to produce top quality 3D computer animators. Our training program focuses on the theoretical and practical aspects of 3D computer animation. This program does not focus on a particular type of software, but rather, teaches the technology of computer animation.

Student Profile and Prerequisites:

Students must be imaginative and motivated to learn the wonderful world of computer graphics and animation. Students must have completed Grade 12 or equivalent. Acceptance will be based primarily upon the following:

- Grade transcripts of the last three years.
- Reference letters from teachers and/or supervisors.
- An interview with the applicant.
- Basic understanding of operating systems and file management.

Length of the Program: The Program is two full years (one summer included), making it an intensive program.

Curriculum

There are compulsory courses and projects that the students must successfully complete:

- Computer Animation Production, topics include: Computer Graphics Theory, 3D Modelling, Animation, Texture and Material Mapping
- Soundtrack Production
- Production Planning
- Introduction to Cel Animation
- Camera Composition and Lighting Technique
- Directing and Storyboarding
- Animation Projects and Productions

Completion:

To complete the two years:

Students must complete all compulsory courses and projects, with an average of 60% or more, and maintain a minimum of 70% attendance.

For further information on this program, please contact: Office of the Registrar, DigiPen Applied Computer Graphics School, 5th Floor, 530 Hornby Street, Vancouver, B.C. Canada, V6C 2E7. Tel: (604) 682-0300 Fax (604) 682-0310 or E-mail: registrar@digipen.com or obtain information at our World Wide Web home page: <http://www.digipen.com/> with ftp site: <ftp://ftp.digipen.com> or send information request to address: 74434.1071@compuserve

- Super Nintendo Entertainment System and Super NES are trademarks of Nintendo of America Inc.
- DigiPen Applied Computer Graphics School reserves the right to make changes to the curriculum without any prior notice.

- 220 (3) Introduction to Discrete Structures – An introduction to computer science applications of discrete mathematics. Sets; logic; functions and relations; induction; program correctness; mathematical rigour; algorithms and applications. Credit for ELEC 320 is equivalent to credit for CPSC 220. Prerequisites: CPSC 116, 118, 126 or 128 (CPSC 126 or 128 may be taken concurrently); MATH 101. [3-0-1; 0-0-0] or [0-0-0]
- 298** (0) Co-operative Work Placement I – Approved and supervised technical work experience in the computing industry for a minimum of 3.5 months. Normally taken during the Winter term of the second year. Technical report required. Restricted to students admitted to the Co-operative Education Program in Computer Science. Prerequisites: CPSC 216, 218, and 220.
- 299** (0) Co-operative Work Placement II – Approved and supervised technical work experience in the computing industry for a minimum of 3.5 months. Normally taken during the summer following the second year. Technical report required. Restricted to students admitted to the Co-operative Education Program. Prerequisite: CPSC 298.
- 302 (3) Numerical Computation for Algebraic Problems – Numerical techniques for basic mathematical processes involving no discretization, and their analysis. Solution of linear systems, including analysis of roundoff errors; norms and condition number; introduction to iterative techniques in linear algebra, including eigenvalue problems; solution to nonlinear equations. Prerequisites: CPSC 122 or 126, MATH 200 and 221. [3-0; 0-0]
- 303 (3) Numerical Approximation and Discretization – Numerical techniques for basic mathematical processes involving discretization, and their analysis. Interpolation and approximation, including splines and least squares data fitting; numerical differentiation and integration; introduction to numerical initial value ordinary differential equations. Prerequisites: CPSC 122 or 126, MATH 200 and 221. [0-0; 3-0]
- 304 (3) File Systems – Tape and disk device characteristics. Blocking and buffering. Access methods and algorithms for sequential, indexed sequential, and direct access files. Topics include B-trees, extendible hashing, secondary keys, multistart and inverted files. Sorting. Prerequisites: CPSC 216, 218. [3-1; 0-0]
- 310 (3) Software Engineering – Specification, design, implementation and maintenance of large, multi-module software systems. Principles, techniques, methodologies and tools for software development. CASE (computer aided software engineering); special topics such as human-computer interfaces, reactive (including real-time) systems, hardware-software interfaces and distributed applications. Prerequisites: CPSC 216, CPSC 220 or ELEC 320. (ELEC 320 may be taken concurrently.) [3-1-0; 0-0-0] or [0-0-0; 3-1-0]
- 311 (3) Definition of Programming Languages – Comparative study of advanced programming language features. Statement types, data types, variable binding, parameter passing mechanisms. Methods for syntactic and semantic description of programming languages. Prerequisites: CPSC 216 and 220. [0-0; 3-1]
- 312 (3) Functional and Logic Programming – Principles of symbolic computing, using languages based upon first-order logic and the lambda calculus. Algorithms for implementing such languages. Applications to artificial intelligence and knowledge representation. Prerequisites: CPSC 216 and 220. [3-1; 0-0]
- 315 (3) Introduction to Operating Systems – Introduction to batch, multiprogramming and time-sharing systems. Process synchronization and communication. Main memory allocation techniques including virtual memory. Process scheduling. Deadlock avoidance and prevention. File organization and device management. Prerequisites: CPSC 216 and 218. Credit can be obtained for only one of CPSC 315 and ELEC 315. [3-1; 0-0] or [0-0; 3-1]
- 318 (3) Machine Structures – Machine organization and classification. Instruction formats and addressing. Input/Output including bus protocols, memory-mapped I/O, direct memory access, and interrupts. Processor architectures including instruction classes, instruction cycle, micro-programming, representation of numeric and non-numeric data. Memory organization. Advanced computer architectures. Credit will be given for only one of CPSC 318, ELEC 476. Prerequisites: CPSC 216, 218. [0-0; 3-1]
- 319 (3) Software Engineering Project – The design, implementation, and test of a large software system, using a team approach. Prerequisite: CPSC 310 (may be taken concurrently). [1-0; 1-3]
- 320 (3) Analysis of Algorithms – A study of the design and analysis of algorithms, illustrated from various problem areas. Topics include: models of computation, choice of data structures, space and time efficiency, computational complexity, algorithms for searching, sorting, and graph-theoretic problems, NP-complete problems. Prerequisites: CPSC 216, 220; MATH 221. [0-0; 3-0]
- 322 (3) Introduction to Artificial Intelligence – Problem-solving and planning; state/action models and graph searching. Natural language understanding. Computational vision. Applications of artificial intelligence. Prerequisites: CPSC 216 and 220. [3-0; 0-0]
- 398** (0) Co-operative Work Placement III – Approved and supervised technical work experience in the computing industry for a minimum of 3.5 months. Normally taken during the summer following the third year. Technical report required. Restricted to students admitted to the Co-operative Education Program in Computer Science. Prerequisite: CPSC 299.
- 399** (0) Co-operative Work Placement IV – Approved and supervised technical work experience in the computing industry for a minimum of 3.5 months. Normally taken during the fall term of the fourth year. Technical report required. Restricted to students admitted to the Co-operative Education Program in Computer Science. Prerequisite: CPSC 398.
- 402 (3) Numerical Linear Algebra – Investigation of the practical techniques of computational linear algebra. Orthogonal transformations and their application to the solution of linear equations, the eigenproblem, and linear least squares. Complete solution of the symmetric eigenproblem, including bisection and the QR method. Refinements of these techniques for sparse matrices. Prerequisites: CPSC 302 and one of MATH 300, 315 or 320. [3-0; 0-0]
- 403 (3) Numerical Solution of Ordinary Differential Equations – Investigation of practical computational methods for ordinary differential equations. Multistep and Runge-Kutta methods for initial value problems. Control of error and stepsize. Special methods for stiff equations. Shooting, finite difference, and variational methods for linear and nonlinear boundary value problems. Prerequisites: CPSC 303 and one of MATH 300, 315 or 320. [0-0; 3-0]
- 404 (3) Introduction to Data Base Management Systems – Data Bases, File Structures for data bases. Data models - Relational, Hierarchical and Network; some languages of Data Base Manipulation. Structure of Data Base Management Systems. Integrity and Security in Data Bases. Prerequisite: CPSC 304 (may be taken concurrently). [3-0; 0-0]
- 405 (3) Modelling and Simulation – Numeric models of dynamic systems with emphasis on discrete stochastic systems. State description of models, common model components and entities. A thorough description of a common simulation language. Simulation using algebraic languages. Methodology of simulation: data collection, model design, analysis of output, optimization, validation. Elements of queuing theory and its relationship to simulation. Applications to models of computer systems. Prerequisites: CPSC 216 and STAT 241. [3-0; 0-0]
- 406 (3) Algorithms for Optimization – The study of algorithmic issues arising in the solution of fundamental combinatorial optimization problems and their applications. Topics include: implementations based on advanced data structures, heuristic algorithms specifically branch and bound, approximation algorithms, complexity and sensitivity analysis. Prerequisites: CPSC 320; MATH 340. [0-0; 3-0]
- 411 (3) Introduction to Compiler Construction – A practical introduction to lexical analysis, syntactic analysis, type-checking, code generation and optimization. This will be used to design and implement a compiler for a small Pascal-like language. Prerequisites: CPSC 218 and 311. [3-0; 0-0] or [0-0; 3-0]
- 414 (3) Computer Graphics – Human vision and colour; modelling; geometric transformations; algorithms for 2-D and 3-D graphics; hardware and system architectures; shading and lighting; animation. Prerequisites: CPSC 216, MATH 200 and 221. Credit will not be given for both CPSC 414 and ELEC 478. [3-1-0; 0-0-0]
- 415 (3) Advanced Operating Systems – Process synchronization and communication schemes, including message-passing and concepts of monitor and serializer. Virtual memory systems management and the problem of information sharing in such systems. The working set principle. Traps and interrupt handling. Elementary queuing theory and its application such as process scheduling, system balancing and load control. File systems and operating system design methodologies. Prerequisite: CPSC 315. [0-0; 3-0]
- 416 (3) Distributed Systems – Introduction to distributed operating systems. Communication architecture and models for interprocess communication. Process migration, naming, distributed file systems, fault tolerance, and concurrency control. Prerequisite: CPSC 315. CPSC 318 is recommended. [3-0; 0-0]
- 417 (3) Computer Communications – Layered protocols, packet switching, data communications, and queuing analysis. Data link controls. Virtual circuits, datagrams, network design, routing, flow and congestion control. Satellite and packet radio links. Local area networks. Prerequisites: CPSC 315 and one of STAT 241 or MATH 302. Credit will be given for only one of CPSC 417 and ELEC 456. [3-0; 0-0]
- 418 (3) Advanced Computer Architectures – Introduction to advanced processor architectures and taxonomical views; performance considerations. Introduction to parallel machine designs. Examination of pipeline organizations, pipelined ALU and control units; representative architectures. Exploratory non-von Neumann architectural models including: object-oriented, tagged, capability, dataflow and RISC designs. Prerequisites: CPSC 315 and 318. [3-1; 0-0]
- 421 (3) Introduction to Theory of Computing – Characterizations of computability (using machines, languages and functions). Universality, equivalence and Church's thesis. Unsolvable problems. Restricted models of computation. Finite automata, grammars and formal languages. Prerequisites: CPSC 216 and 220. CPSC 320 is recommended. [3-0; 0-0]
- 422 (3) Intelligent Systems – Principles and techniques underlying the design, implementation and evaluation of intelligent computational systems. Applications of artificial intelligence to natural language understanding, image understanding and computer-based expert and advisor systems. Advanced symbolic programming methodology. Prerequisites: CPSC 312 and 322. [0-0; 3-0]
- 430 (3) Computers and Society – Impact of computer technology on society; historical perspectives; social and economic consequences of large-scale information processing systems and automatic control; legal and ethical problems in computer applications. Computers and the individual: machine versus human capabilities, fact and fancy; problematic interface between man and machine. Prerequisite: 3 credits of Computer Science and at least Third year standing. [0-0; 3-0]
- 455 (3) Computer-based Image Analysis for Forest Inventory – The digital processing of remotely sensed image data for

- forest inventory. Techniques for acquiring, calibrating, registering, enhancing and interpreting digital satellite data. Digitized planimetric and topographic map data bases. Case studies of existing forest inventory systems. Prerequisite: CPSC 216. [0-0-0: 2-0-2]
- 448 (3-6) c Directed Studies in Computer Science – Open ordinarily to Honours students in Computer Science, with the permission of the Head of the Department. The course may consist of supervised reading, participation in a seminar, and one or more programming projects.
- 449 (6) Honours Thesis and Seminar – Under supervision of a faculty member, students investigate a research topic and prepare a thesis. The course includes a seminar series where faculty members present their research areas and where students describe their progress. Prerequisite: Permission of the Head. (Available to Honours students. Major students with satisfactory academic standing may also be permitted to enrol.)
- 499*(4) Co-operative Work Placement V – Approved and supervised technical work experience in the computing industry for a minimum of 3.5 months. Normally taken during the summer following the fourth year. Technical report required. Restricted to students admitted to the Co-operative Education Program in Computer Science. Prerequisite: CPSC 399.
- 501 (3) Theory of Automata, Formal Languages and Computability – The scope and limitations of effective computation. General and restricted models of computation, formal languages and grammars. Relations between automata and formal languages. Resource bounded computation. Applications in parsing, pattern matching, and the design of efficient algorithms. Prerequisite: CPSC 421. Not all graduate courses are offered every year. Contact the department for current course offerings.
- 502 (3) Artificial Intelligence I – An introduction to AI emphasizing various approaches to the representation of domain specific knowledge and methods of reasoning using these representations. Typical applications to be discussed include natural language understanding systems, problem solving, deductive question-answering, production based expert systems and machine vision. Prerequisite: Sufficient programming background (e.g., CPSC 310) and consent of instructor.
- 503 (3) Computational Linguistics I – Formal models for natural language: phrase-structure grammars, context-free grammars, context-sensitive grammars, transformational grammars; syntactic analysis by computer. Prerequisite: Sufficient programming background (e.g., CPSC 310) and consent of instructor.
- 504 (3) Database Design – Organizing information as relations. Information retrieval through queries against relations. Storing relations as data. Efficient storage and retrieval of data needed by queries. Reliability integrity and security considerations in database design. Prerequisite: CPSC 404.
- 505 (3) Image Understanding I: Image Analysis – Image formation constraints and the processing of digital images in order to extract information about the world being imaged. Computational models for analysis. Prerequisite: Sufficient programming background (e.g. CPSC 310) and consent of instructor.
- 506 (3) Complexity of Computation – Abstract complexity theory, time and space hierarchies, properties of complexity measures. Provably intractable problems, reducibilities and complete problems. P = NP question. Concrete complexity and algorithms design. Resource trade-offs. Prerequisite: CPSC 320.
- 508 (3) Operating Systems – Principles and techniques for the design and implementation of operating systems, especially distributed operating systems and operating systems for parallel computer systems. The concept of object model applied to operating system design. Prerequisite: CPSC 416.
- 509 (3) Programming Language Principles – Comparative study of language constructs: effects on implementation.
- 510 (3) Multigrid and Multilevel Methods – Numerical methods based on multi-level resolution for solving large, sparse systems with an appropriate local structure. Practical and theoretical aspects investigated. Prerequisite: CPSC 302.
- 511 (3) Implementation of Programming Languages – Advanced techniques for the implementation of programming languages. Translator writing systems. Special classes of grammars of interest to compiler writers. Code optimization. Prerequisite: CPSC 411.
- 512 (3) Architecture and Control in Artificial Intelligence – The interaction of computational architecture, control schemes and representational formalism in solving artificial intelligence problems. The concept of a virtual machine. Language constructs for representation and control, logic programming, concurrent systems, object-oriented methods. Serial machines, parallel and distributed machines, coarse-grain to fine-grain parallelism, SIMD/MMD control. Applications to computational vision, robotics, reasoning and diagnosis. Prerequisite: CPSC 312.
- 513 (3) Integrated Systems Design – Integrating software with hardware. Software engineering aspects of real-time and distributed systems. Safety-critical systems. Reliability measures. System validation. Formal specification and verification. Cost estimation and scheduling. Students will undertake a programming project. Prerequisites: CPSC 310, 311 and 318.
- 514 (3) Advanced Computer Graphics – Mathematics and algorithms - geometrical relationships between points, lines, and surface in homogeneous coordinates, hidden surface removal, scan conversion, illumination, and shading, textures, colour. Geometric modelling - Bezier polynomials, B-splines; three-dimensional surfaces, parametric. Coons, Bezier and B-Spline patches. Solid Geometry - Boolean regularized operations, representation schemes. This course is the same as ELEC 593.
- 516 (3) Computational Geometry – The design and analysis of algorithms for geometric problems including convexity, intersection, search, proximity and optimization. Lower bound arguments. NP-completeness results, parallel algorithms, probabilistic algorithms, approximation algorithms, dynamization techniques, effects of preprocessing and other issues applicable to geometric problems. Applications of geometric algorithms. Prerequisite: CPSC 320.
- 517 (3) Sparse Matrix Computation – Algorithms for computational solution of basic numerical linear algebra problems applied to large sparse matrices. Solution of large sparse linear systems by direct and iterative methods; application to linear least squares problems; computation of eigenvalues and singular values of large sparse matrices.
- 518 (3) Computer Systems Performance Evaluation – Basic computer performance evaluation techniques of measurement, simulation and mathematical modeling. Applications to performance improvement, computer selection, planning and computer design. Prerequisite: CPSC 315.
- 519 (3) Logic Programming and Functional Programming – An introduction to the theory, applications and implementation of logic programming languages and functional programming languages. Dataflow architecture to support logic and functional programming languages. Prerequisite: CPSC 311, 312 and 419.
- 520 (3) Numerical Solution of Differential Equations – Finite difference and finite element methods for time-dependent partial differential equations. Explicit and implicit schemes, stability and accuracy considerations, choice of boundary conditions, efficiency of computation, special schemes for particular linear and nonlinear equations. Prerequisite: CPSC 403.
- 522 (3) Artificial Intelligence II – Heuristic search and game playing. Problem solving and planning. Problem reduction, AND/OR trees, goal-directed behaviour. Expert, diagnosis, and advising systems. Knowledge-based systems. Prerequisite: Sufficient programming background (e.g., CPSC 310) and CPSC 503, or consent of instructor. CPSC 502 would be helpful, but is not essential.
- 523 (3) Computational Linguistics II – Natural language processing by computer. Modelling of dialogue and discourse. Applications in question-answering interfaces for large databases. Prerequisite: CPSC 503.
- 525 (3) Image Understanding II: Scene Analysis – Computer-based techniques for image understanding. The development of paradigms for knowledge representation and use in image understanding. Descriptive languages and picture grammars. Block world scene analysis. Control regimes. Programming languages and systems for perception. Representing scene domain knowledge. Applications to various scene domains including remote sensing. Prerequisite: CPSC 505.
- 527 (3) Computer Communication Protocols – Fundamentals of computer communications and OSI lower level protocols. Higher level protocols: transport, session, presentation and application layers. Introduction to formal techniques for protocol specification, verification and testing. Prerequisite: CPSC 417.
- 528 (3) Formal Techniques for Communication Protocols – Current development in higher level protocol standards. Formal description techniques (FDTs). Methods and tools for protocol implementation, testing, and verification/validation. Prerequisite: CPSC 527.
- 529 (3) Definition of Programming Languages – Approaches to defining the syntax and semantics of programming languages.
- 530 (2-6) c Topics in Information Processing
- 531 (3-6) d Topics in Theory of Computation – Possible topics: algebraic structure of automata, program schemata, recursive function theory, computability and logic, language theory.
- 532 (2-6) d Topics in Artificial Intelligence – Possible topics: current issues in representation and control, induction and learning, program synthesis, and robotics.
- 533 (2-6) d Topics in Computer Graphics – Possible topics: curve and surface modeling, including splines; computer animation; rendering techniques, including local and global illumination models, algorithms; modeling natural phenomena; user interface design; colour and human perception; high performance architectures; multimedia and hypermedia.
- 534 (2-6) d Topics in Database Design – Possible topics: studies of particular database systems, design of special query languages, and studies of efficiency, reliability, and security in database.
- 535 (2-6) d Topics in Simulation and Optimization – Possible topics: simulation languages, Monte Carlo methods, construction of models of various natural and artificial systems, implementation of optimization algorithms.
- 536 (2-6) d Topics in Algorithms and Complexity – Possible topics: graph theory - algorithms and applications, geometric complexity, combinatorial algorithms, advanced data structures, arithmetic complexity, circuit complexity, approximation and probabilistic algorithms.
- 537 (2-6) d Topics in Coding and Information Theory – Possible topics: Properties of Shannon's information measure, source encoding discrete memoryless channels, the fundamental theorem of information theory, linear and cyclic error correcting codes; selected topics from the analysis of channels with memory and from algebraic coding theory.
- 538 (2-6) d Topics in Computer Systems – Possible topics: advanced architectures; distributed systems; performance analysis; protocol and software engineering.
- 539 (2-6) d Topics in Programming Languages – Possible topics: formal aspects of translation; formal definition methods; extensible languages; correctness of programs.

- Applications of semantic methods to the design of language.
- 542 (2-6) d Topics in Numerical Computation – Various topics not covered in specific graduate courses in numerical computation.
- 549 (6/12) c Master's Thesis
- 589 (0) M.Sc. Major Essay
- 649 Ph.D. Thesis

Computing Studies Education CSED
SEE CURRICULUM STUDIES, FACULTY OF EDUCATION

Counselling Psychology CNPS
DEPARTMENT OF COUNSELLING PSYCHOLOGY, FACULTY OF EDUCATION

- 362 (3) Basic Interviewing Skills – Development of basic interviewing skills for counselling and guidance. [3-3]
- 363 (3) Career Counselling – Critical survey of career counselling theory and practice. [3-0]
- 364 (3) Family Education and Consultation – Examination of current theories and practices in family education and consultation. [3-0]
- 365 (3) Introduction to Theories of Counselling – An overview of selected theories of counselling. [3-0]
- 426 (6) The Role of the Teacher in Guidance – This course is designed to assist the teacher in understanding and using guidance techniques for day-to-day use in the classroom. The emphasis will be on techniques for working with people towards better self-understanding and better perspectives of alternatives. [2-1; 2-1]
- 427 (3) Guidance: Planning and Decision-making – The work of the beginning counsellor and guidance worker in assisting students with educational, vocational, and personal planning and decision-making. [3-0]
- 433 (3) The Personal and Social Development of the Adult – Personal and social adjustment issues for professional counsellors; basic skills necessary for effective group counselling. [3-3]
- 504 (6) Elementary School Counselling – Theory and practice of elementary school counselling.
- 508 (3-12) c Review of Research in Educational Methods – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 514 (3) Counselling Adolescents – Theory, research, and practice of counselling adolescents.
- 523 (3) Counselling Theory and the Education of Deaf and Hard of Hearing Students – The impact of hearing loss considered from a developmental and family systems perspective; counselling strategies. [3-0]
- 524 (3) Counselling Adults – Major issues and problems of adult development. Selection of appropriate counselling interventions for use in education and other counselling settings.
- 531 (3) Interview and Non-Standardized Measures in Counselling – Theoretical assumptions in the use of non-standardized appraisal techniques.
- 532 (3/6) d Tests in Pupil Personnel Services – The use of standardized measures of mental ability, achievement, aptitude, interest and personality.
- 534 (3) Gender and Sex Role Issues in Counselling – Theory, research, and practice in the area of gender and sex role issues related to counselling.
- 544 (3) Family Counselling I – Counselling approaches as applied to the family, in educational and other counselling settings.
- 545 (3) Family Counselling II – Main theoretical and therapeutic approaches of contemporary family counselling with emphasis on intervention and critical research issues in educational and other counselling settings. Prerequisite: CNPS 544.
- 561 (3-12) c Laboratory Practicum
- 564 (3) Group Counselling – Understanding, designing and knowledge of groups and how to conduct them for use in counselling and guidance services.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 574 (3) Career Planning and Decision-Making Counselling – Theory, research, and practice of career planning and decision counselling. Prerequisite: CNPS 363.
- 578 (3/6) c Counselling Theories and Interventions I – Major counselling theories, interventions for change, and corresponding skill development. Prerequisites: CNPS 362, 365.
- 579 (3) Research in Counselling Psychology – Assumptions and methods of major research paradigms. Prerequisites: EDUC 500 or EPSE 481; EPSE 482 or EPSE 483.
- 580 (3-12) c Problems in Education – Investigation and report of a problem.
- 584 (3) Program Development in Counselling – Designing, implementing, and assessing counselling programs in schools, colleges, universities, and other counselling settings.
- 588 (6) Supervised Training in Counselling – Initial counselling experience under faculty supervision in department training centres.
- 590 (3) Graduating Paper.
- 594 (3) Cross-Cultural Counselling – Critical analysis of cross-cultural counselling theory, research and practice.
- 598 (3/12) c Field Experiences – For those on Master's Program.
- 599 (6/12) c Master's Thesis
- 601 (6/12) c Doctoral Seminar
- 609 (6) Research Approaches in Counselling Psychology – This course examines the assumptions and methods of major research paradigms, critically assesses a selection of current research, and then uses various approaches to construct research projects.
- 677 (3) Theories of Vocational Development – Sociological and psychological aspects of career planning, theories of vocational development, vocational choice.
- 678 (6) Theoretical Perspectives in Counselling Psychology – Major theoretical traditions in Counselling Psychology and illustration of the links among theory, research and practice; perspectives on Counselling Psychology as a distinct field of specialization.
- 679 (3) Information Systems in Guidance and Counselling – The application of automatic data processing to guidance and counselling in student accounting, job placement, information dissemination and in interviewing. Prerequisite: Course in Computer Science.
- 688 (6) Supervision of Counselling Practice – Supervision requires both knowledge of supervision models and practices, and skills to implement them. This course involves a seminar and practicum to integrate the two requirements of the subject.
- 698 (6) Pre-doctoral internship. – A 1600 hour supervised internship in Counselling Psychology. Internship sites offer counselling services as detailed in the "Specialty Guidelines for the Delivery of Services by Counselling Psychologists" (APA).
- 699 Doctoral Thesis
- 202 (6) Creative Forms – Designed for beginning writers, including first-year students by special permission. Short story, shorter play forms, and verse. Instructors may also give assignments in other forms such as plays for screen, television or radio, or imaginative non-fictional prose. [0-3; 0-3]
- 301 (6) Writing Techniques – Designed for beginning writers and other students who have a particular interest in the uses of literary techniques and ways of transferring these from one genre to another. The course is very suitable for prospective teachers and writers from the Diploma in Applied Creative Non-fiction. Major emphasis is given to the students' own writing. Performance in workshop (i.e., opportunity to respond and evaluate others' work) and an understanding of technique and basic principles in writing make up a minor portion of the final evaluation. [0-3; 0-3]
- 403 (6) Writing of Children's Literature – Techniques of writing for children in various genres. Limitations as to the children's age group and genres to be set by the instructor. Instruction given through workshop and individual tuition. [0-3; 0-3]
- 404 (6) Writing of Drama and Features for Radio [0-3; 0-3]
- 405 (6) Creative Forms and Techniques of Non-Fiction – The use of literary techniques in the writing of non-fictional forms such as personal essay and memoir, biography, autobiography, travelogue, popular history, and miscellany. Projects range in length from magazine articles to books. [0-3; 0-3]
- 406 (6) Writing of Drama for Screen and Television – Some studio work may be required. Focus is on writing. Students whose chief interest is film or TV production should refer to Theatre Department listings. [0-3; 0-3]
- 407 (6) Writing of Drama for the Stage – Studio work is required, and some plays may be given workshop production. [0-3; 0-3]
- 408 (6) Writing of the Novella or Novel [0-3; 0-3]
- 409 (6) Writing of the Short Story [0-3; 0-3]
- 410 (6) Writing of Poetry [0-3; 0-3]
- 415 (6) Theory and Practice of Translation – Prerequisite: Evidence of promise as a translator and proficiency in at least one language other than English. (Where a language department is regularly consulted on a project, the language adviser may assign marks equal to three credits of the course work.) [0-3; 0-3]
- 416 (6) Applied Creative Non-Fiction – The application of the forms and literary techniques of Creative Non-Fiction to writing for a general audience in business, science, industry, law, culture, medicine, and other major areas of professional interest. Students will be assigned to stories and taught the use of the basic research techniques such as the interview. Projects range in length from magazine articles to books. [0-3; 0-3]
- 417 (6) Play Development Workshop – An interdisciplinary course, in co-operation with the B.F.A. Acting-Directing Program in Theatre, emphasizing script development through scenework, character development, and stagecraft. Prerequisite: Manuscript submission or equivalent theatre experience. [0-3; 0-3]
- 439 (6) Special Projects in Creative Writing [0-3; 0-3]
- 447 (6) Directed Reading – The course will emphasize current trends and techniques rather than critical evaluation. Not offered every year. [0-3; 0-3]
- 491 (6) Tutorial in Writing of Children's Literature – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]
- 492 (6) Tutorial in Writing of Non-Fictional Prose – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]
- 493 (6) Tutorial in Writing of Drama and Features for Radio. – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]

Creative Writing CRWR
FACULTY OF ARTS

For admission requirements for all courses see Creative Writing entry under Arts.

- 494 (6) Tutorial in Writing of Drama for Screen and Television. – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]
- 495 (6) Tutorial in Translation – For students who receive departmental permission to do special advanced work in translation. [0-3; 0-3]
- 496 (6) Tutorial in Poetry – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]
- 497 (6) Tutorial in Fiction – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]
- 498 (6) Tutorial in Drama – For students who receive departmental permission to do special advanced work in this genre. [0-3; 0-3]
- 503 (6) Advanced Writing of Children's Literature
- 504 (6) Advanced Writing of Drama and Features for Radio
- 505 (6) Creative Forms and Techniques of Non-Fiction (Advanced)
- 506 (6) Advanced Writing of Drama for Screen and Television
- 507 (6) Advanced Writing of Drama for the Stage
- 508 (6) Advanced Writing of the Novella or Novel
- 509 (6) Advanced Writing of Short Fiction
- 510 (6) Advanced Writing of Poetry
- 515 (6) Advanced Workshop in Translation – (Where a language department is regularly consulted on a project, the language adviser may assign marks equal to 3 credits of the course work.)
- 516 (6) Applied Creative Non-Fiction (Advanced)
- 517 (6) Advanced Play Development Workshop – An interdisciplinary course, in co-operation with the Acting and the M.F.A. Directing programs in Theatre, emphasizing script development through scenework, character development, and stagecraft. Prerequisite: Manuscript submission or equivalent theatre experience.
- 521 (6) Editing and Managing a Literary Magazine – Operation of a literary magazine; editing and evaluating creative writing submissions. Prerequisite: Permission of the instructor.
- 539 (6) Advanced Projects in Creative Writing
- 547 (6) Directed Reading – May not be offered every year.
- 549 (6) Thesis
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- Curriculum Studies**
FACULTY OF EDUCATION
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- Art Education** **ARTE**
- 303 (6) Ceramics in Art Education – Exploration of ceramic techniques, including hand building and basic throwing. Prerequisites: FINA 181 and six credits of art history. [1-3; 1-3]
- 305 (6) Design in Art Education – Exploration of design, particularly in relation to textiles. Prerequisites: FINA 181 and six credits of art history. [1-3; 1-3]
- 314 (4) Curriculum and Instruction in Art: Secondary – Curriculum organization in art; principles and methods of instruction applied to teaching art. Prerequisite: a completed concentration in art or permission of the Head; co-requisite: EDUC 311. [2-4; 0-0]
- 320 (2) Curriculum and Instruction in Art: Elementary – Curriculum organization in art; principles and methods of instruction applied to teaching art. Prerequisite: EDUC 310. [1-2]
- 321 (3) Microcomputers in Art and Music Education – Computer skills in art and music, and their application in a model studio setting. Lectures, tutorials, and studio work. (Same course as MUED 321.) [1-4]
- 322 (3) Advanced Microcomputer Applications in Music and Art – Application of skills and experience with music and graphics software and hardware to creative multimedia projects, exploring relationships between teaching and learning models. Lectures and studio work. (Same course as MUED 322.) Prerequisite: ARTE 321. [1-4]
- 400 (2-12) d Studies in an Art Education Studio Area – Directed studies in an area relevant to teaching in an elementary or secondary school. Offered in ceramics, drawing and painting, graphics, sculpture, textiles, and photography. Prerequisite: 18 credits of Art Education or Fine Arts studio courses.
- 425 (3) Explorations in the Teaching of Art to Children – A laboratory-based art education course in which students work with elementary aged children. Prerequisite: ARTE 314 or 320. [1-3]
- 426 (3) Art, Education and Cultural Diversity – Implications of cultural diversity for teaching of art in elementary and secondary schools. [3-0]
- 441 (3) Art Education Theory and Research – Art Education theory and research is studied relative to school practice. Prerequisites: Art Education as a major or minor field and completion of a practicum in Art Education. [3-0]
- 508 (3-12) c Review of Research in Art Education Methods – Studies of recent research bearing on art education practice.
- 541 (3) Perspectives, Practice, and Curriculum Issues in Contemporary Art Education – Emphasis is placed upon the foundations and conflicting conceptions of curriculum in art education. Theory/practice issues in the development, implementation, and evaluation of art programs are explored.
- 542 (3) Historical and Social Foundations of Art Education – Histories of art education are examined. Social and cultural implications for art education (past and present) are explored.
- 543 (3) Psychological Foundations of Art Education – Psychological considerations specifically related to cognitive development in art, are explored. Implications for art education theory and practice are drawn.
- 561 (3-12) c Laboratory Practicum
- 565 (3/6) d Special Topics in Art Education
- 580 (3-12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3-12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 601 (3-12) d Doctoral Seminar
- Business Education BUED
- 314 (4) Curriculum and Instruction in Business Education – Curriculum organization in business education; principles and methods of instruction applied to teaching business education. Prerequisite: a completed concentration in business education or permission of the Head. Corequisite: EDUC 311. [3-2]
- 374 (6) Office Organization and Information Processing – Office organization, business communication and office information systems. [3-2; 3-2]
- 377 (3) Systems of Data Processing – Types and organization of business systems; electronic methods of data processing; criteria and procedures for software evaluation. Teaching methods and projects for secondary schools. Pre- or co-requisite: BUED 401. [0-0; 2-1]
- 401 (3) Curriculum and Instruction in Keyboarding – Principles and problems of instruction and skill building on alphanumeric and ten-key keyboards. [4-0]
- 402 (3) Curriculum and Instruction in Keyboarding – Principles and problems of instruction on business documents. Prerequisite: BUED 401. [4-0]
- 410 (6) Cooperative Programs in Career Education – Concepts of career education; the relation of work experience to career education. The role of the co-ordinator in designing and administering cooperative programs. [3-0; 3-0]
- 508 (3-6) d Review of Research in Business Education. – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 561 (3-12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3-12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3-12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
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- Computing Studies Education** **CSED**
- 314 (4) Curriculum and Instruction in Computer Studies: Secondary – Curriculum organization in computer science; principles and methods of instruction applied to teaching computer science. Prerequisite: a completed concentration in computer science or permission of the Head. Corequisite: EDUC 311. [2-4]
- 400 (3) Computers in Education – Current research and practice concerning uses of computers in education, including computer-assisted instruction and computer-augmented instruction. [3-0]
- 402 (3) Professional Use of Microcomputers for Teachers – Principles and techniques of using microcomputers to improve teaching performance and classroom administration. Students will use word-processors, spreadsheets, graphics utilities, data base programs, and other software useful to teachers. [3-1]
- 420 (3) Computers for Instruction – Instructional applications of microcomputer programs in a variety of subject areas; basic design and sequencing of educational software. Introduction to a programming language. [3-2]
- 422 (3) Computers in the Elementary School – Theory and practice concerning the use of microcomputers in the elementary school. [3-2]
- 424 (3) Computers in the Secondary School – Theory and practice concerning the use of microcomputers in the secondary school, including software design and programming. [3-2]
- 450 (3) Development of Educational Software – The software development process; principles and techniques for effective communication with a microcomputer; formative software evaluation. Students will design and develop an instructional package. Prerequisite: CSED 420. [3-2]
- 508 (3-6) d Review of Research in Computing Studies – Studies are made of recent research bearing on the applications of computers in education.
- 546 (3) Seminar in the Teaching of Computing Studies – Curriculum, instruction and organization of computing studies courses in the secondary school. Prerequisite: CSED 314 or extensive experience with teaching computing studies in the schools.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3-12) c Problems in Computing in Education – Investigation and report of a problem from the area of Computing Studies Education.
- 590 (3) Graduating Paper.
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- Curriculum Studies** **CUST**
- 565 (3/6) d Special Course in Subject Matter Field
- 601 (3-12) d Doctoral Seminar
- 699 Doctoral Thesis

Home Economics Education**HMED**

- 314 (4) Curriculum and Instruction in Home Economics: Secondary – Curriculum organization in home economics; principles and methods of instruction applied to teaching home economics. Prerequisite: a completed concentration in home economics or permission of the Head; corequisite EDUC 311. [2-4]
- 414 (3) Curriculum and Instruction in Home Economics – Curriculum development with an emphasis on reflection on practice and current curriculum issues. Prerequisite: HMED 314. [3-0]
- 465 (3-6) d Special Topics in Home Economics Education – Advanced courses in specialized topics of curriculum, instruction, and issues of practice. Prerequisite: HMED 314 and some teaching experience. [3-0]
- 508 (3-6) d Review of Research in Home Economics Education. – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 514 (3) Curriculum and Instruction in Home Economics – Advanced studies of curriculum and instruction theories, and research. Prerequisite: HMED 414.
- 545 (3) Foundations of Home Economics Education – A review and critical analysis of the history and philosophy of school home economics programs.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3-12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3-12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis

Mathematics and Science Education MAED

- 314 (4) Curriculum and Instruction in Mathematics: Secondary – Curriculum organization in mathematics; principles and methods of instruction applied to teaching mathematics. Prerequisite: a completed concentration in mathematics or permission of the Head; co-requisite EDUC 311. [2-4]
- 320 (2) Curriculum and Instruction in Mathematics: Elementary – Curriculum organization in mathematics; principles and methods of instruction applied to teaching mathematics. Prerequisite: EDUC 310. [1-2]
- 372 (3) Mathematics Teaching: Problem Solving – Problem solving strategies, and methods for teaching such strategies in elementary and junior secondary schools. Prerequisite: MAED 314 or 320. [3-0]
- 373 (3) Mathematics Teaching: Geometry and Measurement – Topics in geometry, and methods for improving the learning of geometry and measurement in elementary and junior secondary schools. Prerequisite: MAED 314 or 320. [3-0]
- 471 (3/6) d Diagnosis and Remediation in Elementary School Mathematics – A clinical course which includes task analyses of the major concept and skill hierarchies, taxonomies of mathematical objectives, and the place of standardized diagnostic testing in elementary mathematics. Prerequisite: MAED 320; or co-requisite: MAED 314. [3-1; 1-3]
- 485 (3) Mathematics History for Teachers – A study of the historical development of selected topics from the mathematics curriculum of elementary and junior secondary schools. Among others, the topics will include systems of numeration, methods of calculating, measurement systems. [3-0]
- 488 (3) Mathematics Education (Elementary) – An advanced course in curriculum and instruction. Prerequisite: MAED 320. [3-0]

- 508 (3-6) d Review of Research in Mathematics Education. – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 545 (3) Foundations of Mathematics Education
- 547 (3) Mathematics Teaching in the Elementary School – Recent theories and research. Prerequisite or co-requisite: EDUC 508.
- 548 (3) Mathematics Teaching in the Secondary School – Recent theories and research. Prerequisite or co-requisite: EDUC 500.
- 549 (3) Mathematics Education (Secondary) – An advanced course in curriculum and instruction. Prerequisite: MAED 314.
- 561 (3/12) c Laboratory Practicum
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3-12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis

Music Education**MUED**

- 106 (2) Music Curricula in Schools – Lectures, discussions, demonstrations, and observations of a range of music curricula. [1-2]
- 302 (4/6) d Instrumental Techniques – Instruction in the playing and teaching techniques of strings, brasses and woodwinds. Prerequisite: MUED 201 or MUSC 200. [2-0; 2-0] or [3-0; 3-0]
- 303 (4/6) d Choral Music – Principles and techniques of choral music. Prerequisite: MUED 201 or MUSC 200. [2-0; 2-0] or [3-0; 3-0]
- 304 (3) Classroom Instruments I – Development of teaching techniques and materials, arranging, and playing skills for guitar, recorder, pitched percussion instruments, ukulele, dulcimer, autoharp, and piano in traditional and contemporary (Music Learning Theory) contexts. [1-2]
- 305 (3) Classroom Instruments II – Advanced development of teaching techniques and materials, arranging, and playing skills for guitar, recorder, pitched and non-pitched percussion instruments, ukulele, dulcimer, autoharp, and piano in traditional and contemporary (Music Learning Theory) contexts. Prerequisite: MUED 304. [1-2]
- 307 (3) Advanced Music Curriculum and Instruction (Elementary) – Philosophy, objectives, curriculum, methods, and materials for teaching music in elementary schools. Prerequisite: MUED 320. [3-0]
- 308 (3) Elementary Choral Music – Foundations for choral singing: the child voice; methods and materials for elementary singers; choral and conducting techniques. Prerequisite: MUED 320 and ability to read music. [0-3]
- 314 (4) Curriculum and Instruction in Music: Secondary – Curriculum organization in music; principles and methods of instruction applied to teaching music. Prerequisite: a completed concentration in music or permission of the Head; corequisite EDUC 311. [2-4]
- 320 (2) Curriculum and Instruction in Music: Elementary – Curriculum organization in music; principles and methods of instruction applied to teaching music. Prerequisite: EDUC 310. [1-2]
- 321 (3) Microcomputers in Art and Music Education – Computer skills in art and music, and their application in a model studio setting. Lectures, tutorials, and studio work. (Same course as ARTE 321.) [1-4]
- 322 (3) Advanced Microcomputer Applications in Music and Art – Application of skills and experience with music and graphics software and hardware to creative multimedia projects, exploring relationships between teaching and learning models. Lectures and studio work. (Same course as ARTE 322.) Prerequisite: MUED 321. [1-4]
- 332 (3) Instrumental Jazz Pedagogy – Teaching instrumental jazz in the secondary school. [3-0]
- 333 (3) Choral Jazz Pedagogy – Teaching choral jazz in the schools. [3-0]
- 335 (3) Orff Basics – Introduction to the Orff approach to Music Education. Prerequisite: MUED 320. [1-2]
- 336 (3) Kodaly I – Introduction to the Kodaly approach to Music Education. Prerequisite: MUED 320. [1-2]
- 339 (3) The Musical – Organization and production of school musicals. [3-0]
- 340 (3) Canadian Music in the Classroom – Aspects of Canadian music suitable for elementary and secondary school curricula. The interrelation between music and other subjects. [3-0]
- 345 (6) Education Through Music I – Musical elements, studied through the song-experience games of English language folk literature, as appropriate for Kindergarten - Grade 8. Rhythm, melody, harmony, and expressive musical elements. Application to movement and to social, linguistic, and cognitive growth of both children and adults. Aural musicianship, philosophy and pedagogy. Prerequisite: MUED 320. Offered during Summer Session, Term 2 only.
- 401 (2) Arranging for Chorus, Band, and Orchestra – Arranging, instrumentation, and scoring for concert and stage bands and choirs. Arranging styles and principles. Problems of rhythm, meter, and chord structures and progressions. Pre- or co-requisite: MUED 302 and MUSC 309. [1-2]
- 405 (3) Electronic Music – Development of classroom strategies for scoring and composing music using electronic music sequencing and composition programs. [3-0]
- 412 (3) Music Education for Children with Exceptional Needs – The practice and theory of music as used for the education of children with exceptional needs. Prerequisite: EPSE 312 or 317. [3-0]
- 435 (6) Orff Level I – The Orff Schulwerk curriculum: with attention to movement and to instrumental and choral music. Rhythm, melody, harmony, timbre, and form. Aural musicianship, philosophy, and pedagogy. Prerequisite: MUED 335 or music rudiments (Grade II, Toronto Conservatory; Grade IV, Western Board; or equivalent). Offered during Summer Session, Term 2 only.
- 436 (2) Kodaly II – Advanced study of Kodaly methods, strategies, and curricula. Prerequisite: MUED 336. [0-2]
- 437 (6) Orff Level II – The Orff Schulwerk curriculum with attention to increasingly more complex musical forms and approaches and to improvisation. Prerequisite: MUED 435. Offered during Summer Session, Term 2 only.
- 438 (6) Orff Level III – Advanced studies of the Orff Schulwerk curriculum and pedagogy with peer practice teaching. Prerequisite: MUED 437. Offered during Summer Session, Term 2 only.
- 445 (6) Education Through Music II – Further studies of the song-experience games of English language folk literature. Piaget's theories of thinking and learning music in relation to language acquisition. Attention to vocal and instrumental literature of the 18th and 19th centuries. Aural musicianship, reading and writing music, analysis, philosophy and pedagogy. Prerequisite: MUED 345. Offered during Summer Session, Term 2 only.
- 446 (6) Education Through Music III – Advanced studies of musical elements through the song-experience games of English language folk literature, focussing on the vocal and instrumental literature of the 18th, 19th, and 20th centuries. Attention to aesthetic experiences as a foundation for education. Aural musicianship, reading and writing music, analysis, philosophy and pedagogy. Prerequisite: MUED 445. Offered during Summer Session, Term 2 only.
- 508 (3) Review of Research in Music Education Methods – Studies of recent research bearing on music education

- practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 542 (6) Theory and Principles of Music Education – Supervision and administration of music education: Individual projects in special interest areas. Prerequisite: a major in Music Education.
- 561 (3/12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 601 (3/12) d Doctoral Seminar
- 699 Doctoral Thesis
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- Physical Education PETE**
- 314 (4) Curriculum and Instruction in Physical Education: Secondary – Curriculum organization in physical education; principles and methods of instruction applied to teaching physical education. Prerequisite: a completed concentration in physical education or permission of the Head. Corequisite: EDUC 311. [2-4]
- 320 (2) Curriculum and Instruction in Physical Education: Elementary – Curriculum organization in physical education; principles and methods of instruction applied to teaching physical education. Prerequisite: EDUC 310. [1-2]
- 326 (3) Elementary School Physical Education: Curriculum – Physical education curricula for elementary school grades with reference to research, resources, and curriculum trends and practices. Prerequisite: EDUC 320. [3-0]
- 327 (3) Elementary School Physical Education: Instruction – Teaching approaches in elementary school physical education; philosophy, planning, implementation, and evaluation; resources and resource management; issues and research. Prerequisite: EDUC 320. [3-0-0]
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- Science Education SCED**
- 190 (6) General Science – The major ideas and techniques in the biological sciences (biology, botany, zoology, and physical sciences (physics, chemistry, astronomy, and geology). While experience is provided in studying science in a systematic way, concepts are interpreted for use in teaching at the elementary school level. [3-2; 3-2]
- 309 (3) Biological Science for Elementary School Teachers – An advanced course in biological science with applications to elementary school science teaching. Recent developments introduced. Prerequisite: SCED 190 or six credits of first-year laboratory science. [3-2]
- 310 (3) Physical Science for Elementary School Teachers – An advanced course in physical science with applications to elementary school science teaching. Recent developments introduced. Prerequisite: SCED 190 or six credits of first-year laboratory science. [3-2]
- 312 (2) Curriculum and Instruction in Agricultural Science – Curriculum organization in agricultural sciences; principles and methods of instruction applied to teaching agricultural sciences. Prerequisite: a completed concentration in agricultural sciences or permission of the Head; corequisite EDUC 311. [1-2]
- 313 (2) Curriculum and Instruction in Biological Sciences – Curriculum organization in biological sciences; principles and methods of instruction applied to teaching biological sciences. Prerequisite: a completed concentration in biological sciences or permission of the Head; corequisite EDUC 311. [1-2]
- 314 (2) Curriculum and Instruction in Chemistry: Secondary – Curriculum organization in chemistry; principles and methods of instruction applied to teaching chemistry. Prerequisite: a completed concentration in chemistry or permission of the Head; co-requisite EDUC 311. [1-2]
- 315 (2) Curriculum and Instruction in Earth and Space Science: Secondary – Curriculum organization in earth and space science; principles and methods of instruction applied to teaching earth and space science. Prerequisite: a completed concentration in earth and space science or permission of the Head; corequisite EDUC 311. [1-2]
- 316 (2) Curriculum and Instruction in General Science: Secondary – Curriculum organization in general science; principles and methods of instruction applied to teaching general science. Prerequisite: a completed concentration in agricultural sciences, biological sciences, chemistry, earth and space science, or physics or permission of the Head; co-requisite EDUC 311. [1-2]
- 317 (2) Curriculum and Instruction in Physics: Secondary – Curriculum organization in physics; principles and methods of instruction applied to teaching physics. Prerequisite: a completed concentration in physics or permission of the Head; corequisite EDUC 311. [1-2]
- 320 (2) Curriculum and Instruction in Science: Elementary – Curriculum organization in science; principles and methods of instruction applied to teaching science. Prerequisite: EDUC 310. [1-2]
- 380 (3) Environmental Science Education – Curriculum implications of physical and biological environmental issues. Field experiences are normally part of the course; transportation and living expenses will be borne by the student. [3-2]
- 409 (3/6) d Science Education – An advanced course in problems of practice in four areas of teaching elementary science aims and policy, organization and administration, curriculum, and teaching-learning. Problems are considered in their theoretical contexts. Prerequisite: SCED 320; and SCED 190 or six credits of first year laboratory science. [2-2; 2-2]
- 411 (3) Forest Education – Forest studies in the science curriculum; the forest environment as a teaching resource; selection of teaching sites. Transportation and living costs for required field experiences will be borne by the student. [3-0]
- 412 (3) Computer-based Science Education – Integration of microcomputers and related technology into secondary science instruction. Applications to experiments, lessons, activities, and demonstrations in biology, chemistry, general science, geoscience, and physics. Prerequisite: CSED 402, 420, or previous computer experience. [3-2]
- 413 (3) Conceptions of the Natural World: Implications for Science Education – Conceptual and practical issues associated with diverse human understandings of the natural world and their applications to classroom practice. [3-0]
- 506 (3) Research in School Health Education – Research in specific areas of school health education and theories on which health behavior changes are grounded. Prerequisite: EDUC 306 or equivalent.
- 507 (3) Seminar in School Health Education – Current trends, problems and issues in school health education and the development of strategies for dealing with health education problems and issues in the schools. Prerequisite: EDUC 306 or equivalent
- 508 (3/6) d Review of Research in Science Education – Studies of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 510 (3/6) d Problems in Curriculum Development in Science Education – Problems of practice in the development of science curricula. Special emphasis is given to science curricula in B.C.
- 517 (3) Critical Analysis of Goals in School Sciences – A review of selected purposes of school science in light of current ideas about the nature of science and its implications for scientific literacy.
- 518 (3) Theory and Research in the Social Context of School Science – Historical and current social, political and economic influences on science curriculum and science teaching.
- 520 (3) Science Learning in Informal Environments – Theoretical perspectives and current research on science learning in contexts other than formal science classes.
- 544 (3) Issues in the Teaching and Learning of the School – Conceptual and practical issues associated with contemporary constructivist approaches to educational inquiry in the school sciences.
- 545 (3) Research in the Teaching and Learning of the School – Current models and methods of inquiry in the school sciences, particularly using constructivist approaches.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 581 (3) Theory and Research in Environmental Education – Research literature and theoretical issues in environmental education.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 699 Doctoral Thesis
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- Social Studies Education SSED**
- 312 (4) Curriculum and Instruction in Social Studies: Secondary – Curriculum organization in social studies; principles and methods of instruction applied to teaching social studies. Prerequisite: A completed concentration in one of the social studies disciplines or permission of the Head. Corequisite: EDUC 311. [2-4]
- 317 (2) Curriculum Topics in Social Studies: Secondary – Selected topics in social studies instruction. Topics may include integration of social studies with humanities; dealing with values, multicultural, and global education; and gender issues in social studies. Pre- or co-requisite: SSED 312. [1-2]
- 320 (2) Curriculum and Instruction in Social Studies: Elementary – Curriculum organization in social studies; principles and methods of instruction applied to teaching social studies. Prerequisite: EDUC 310. [1-2]
- 324 (3) Curriculum and Instruction in Canadian Studies – Curriculum organization in Canadian Studies; principles and methods of instruction applied to teaching topics on Canada. Pre- or co-requisite: SSED 312 or 320. [2-1]
- 361 (3) Introduction to Curriculum and Instruction in Law-related Education – The rationales and objectives, teaching and learning activities, and curriculum materials for law-related education in elementary and secondary schools. [3-0]
- 421 (3) Advanced Social Studies Curriculum: Elementary – Recent research and curriculum developments with particular reference to the design of curriculum materials. Prerequisite: SSED 320. [3-0]
- 422 (3) Advanced Social Studies Instruction: Elementary – Recent research in instructional techniques with particular emphasis on instructional design. Prerequisite: SSED 320. [0-0; 3-0]
- 469 (3/6) c Introduction to Current Practices in Values Education – Examination of recognized approaches to values education, including strategies, curriculum materials, rationale and theory, and research evidence. Critical exami-

- nation and practical applications of approaches will be emphasized. [3-0; 3-0]
- 508 (3/12) c Review of Research in Educational Methods – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 511 (3) Problems in Historical Understanding – Recent controversies in North American historical literature and implications for school curriculum in the light of research on teaching and learning history. Issues include gender, ethnicity, environmental history, and the objectivity question.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis

Technology Studies Education TSED

- 314 (4) Curriculum and Instruction in Technology Education – Curriculum organization in technology education; principles and methods of instruction applied to teaching technology education. Prerequisite: a completed major in technology education or permission of the Head; corequisite EDUC 311. [2-4]
- 414 (3/6) d Curriculum Development in Technology Education – Curriculum and course design, with emphasis on current practice. Prerequisite: TSED 314. [3-0]
- 416 (3/6) d Special Topics in Technology Studies Education – Specialized topics in curriculum, instruction, and issues of practice. Prerequisite: TSED 314. [3-0]
- 465 (3/12) c Technical Problem – This course gives students the opportunity to conduct directed study in an area within their technical field of specialization. Each directed study will culminate in a written paper. Prerequisites: Completion of a technical specialty or equivalent.
- 508 (3-6) d Review of Research in Technology Studies Education. – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 561 (3/12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis

Dentistry FACULTY OF DENTISTRY

See courses listed below under Clinical Dental Sciences (CDSC), Dentistry (DENT), Oral Biology (ORB), Medical and Surgical Sciences (OMSS)

Clinical Dental Sciences

- 400 (6) Current Issues in Oral Health Sciences – Critical reviews of oral health care delivery, oral disease processes and dental hygiene. [3-0-0; 3-0-0]
- 401 (2) Dental Epidemiology – Preventive dentistry, oral epidemiology and the study of special populations in dentistry. [1-0-0; 1-0-0]
- 402 (8) Dental Hygiene Care – Dental hygiene concepts, processes, and skills for individuals and communities. [3-3-0; 3-3-0]

- 404 (6) Advanced Dental Hygiene Care – Advanced dental hygiene concepts, processes and skills in community health, educational or institutional settings. Prerequisite: CDSC 402. [3-0; 3-0]
- 406 (3-12) c Guided Study in Dental Hygiene – Elective offered only in final year. [3-0-0; 3-0-0]
- 410 (5) Introductory Operative Dentistry – Biological principles and technical skills for cavity preparation and design, including properties of appropriate dental materials. [1-2-0; 2-5-0]
- 411 (1) Introductory Orthodontics – Craniofacial and dental relations, aberrations in different malocclusions and analysis of orthodontic records. [1-1-0]
- 414 (3) Preventive Dentistry – Etiology, epidemiology and methods of prevention of dental diseases. [2-0-0; 1-0-0]
- 420 (3) Basic Operative Dentistry – Cavity preparation and design, placement of temporary and permanent restorations, principles and procedures for successful clinical practice. [1-2-0; 1-3-0]
- 421 (2) Basic Orthodontics – Diagnosis, treatment planning, biomechanical principles and appliance design and fabrication. [1-3-0]
- 422 (2) Introductory Pediatric Dentistry [1-3-0]
- 423 (1) Introductory Periodontics – Theory and practice of diagnosis and treatment of diseases and conditions of the supporting tissues of the teeth or their implanted substitutes. [1-2-0]
- 424 (2) Community Dentistry – Dental public health programs in Canada and current issues facing the dental profession. [2-0-0]
- 425 (5) Introductory Prosthodontics – The art and science of replacing missing teeth and surrounding tissues. [1-2-0; 2-5-0]
- 430 (4) Operative Dentistry [0-4-5-0; 0-1-5-0]
- 431 (3) Orthodontics – Differential diagnosis, treatment planning, biomechanical principles and clinical treatment. [1-2-0; 1-2-0]
- 432 (4) Pediatric Dentistry [0-4-5-0; 1-4-5-0]
- 433 (3) Periodontics – Diagnosis and treatment of diseases and conditions of the supporting structures of the teeth and their implanted substitutes. [1-2-5-0; 0-2-5-0]
- 434 (2) Behavioural Sciences in Dentistry [1-0-0; 1-0-0]
- 435 (8) Prosthodontics I – The art and science of restoring and replacing teeth and surrounding tissues. [2-5-0; 1-9-0]
- 440 (2) Advanced Operative Dentistry [0-3-0; 0-3-0]
- 441 (3) Advanced Orthodontics [1-2-0; 0-5-0]
- 442 (1) Advanced Pediatric Dentistry [0-3-0]
- 443 (4) Advanced Periodontics – Assessment and treatment of advanced periodontal diseases. [1-3-0; 1-3-0]
- 444 (4) Practice Management – Ethics, jurisprudence, practice management, intra- and interprofessional relationships. [2-0-0; 2-0-0]
- 445 (8) Prosthodontics II – The art and science of restoring and replacing teeth and surrounding tissues. [1-9-0; 0-12-0]
- 461 (4) Literature Review in Periodontology I [2-0-0; 2-0-0]
- 462 (4) Literature Review in Periodontology II – A continuation of CDSC 461. [2-0-0; 2-0-0]
- 501 (3) Cell Biology of Diseased and Healing Periodontium
- 502 (6) Literature Review in Periodontology I.
- 503 (6) Literature Review in Periodontology II.
- 510 (2) Periodontal Case Management
- 513 (3) Implant Therapy
- 514 (1) Periodontal Treatment Planning Seminars
- 516 (2) Guided Tissue Regeneration
- 550 (3-6) c Advanced Topics in Restorative Dentistry
- 561 (2-6) d Directed Studies in Clinical Dental Sciences

- 700 Directed Studies in Orthodontics
- 701 Advanced Clinical Orthodontics
- 711 Clinical Periodontics – This course also lists as CDSC 721 and 731.
- 715 Periodontal Therapy Seminars – This course also lists as CDSC 725 and 735.
- 723 Prescription Periodontal Surgery
- 729 Hospital Dentistry and Anesthesiology

Dentistry DENT

- 599A (12) Master's Thesis – Enrollment restricted to Graduate Students in Oral Biology.
- 599B (12) Master's Thesis – Enrollment restricted to Graduate Students in Clinical Dental Sciences.
- 599C (12) Master's Thesis – Enrollment restricted to Graduate Students in Oral Medical and Surgical Sciences.

Oral Biology ORBI

- 410 (5) Oral Embryology and Oral Histology [4-2-0]
- 411 (2) Structure and Function of Oral Tissues [2-0-0]
- 412 (2) Dental Morphology and Arch Form [1-0-2]
- 413 (2) Introductory Biomaterials Science [2-0-0]
- 420 (2) Principles of Occlusal Function and Articulation [1-0-2]
- 423 (2) Dental Materials Science [2-0-0]
- 430 (2) Understanding and Evaluating Dental Research [1-0-0]; [1-0-0]
- 440 (1) Advanced Topics in Oral Biology [1-0-0]
- 448 (2-6) d Directed Research in Oral Biology – An elective laboratory project taken with the permission of the appropriate supervisor and the Head of the Department.
- 500 (6) Research Methods and Seminars in Oral Biology [3-0-0]; [3-0-0]
- 501 (6) Craniofacial Biology – Credit will not be given for both ORBI 501 and 503. [3-0-0]; [3-0-0]
- 502 (6) Biology of Oral Tissues [3-0-0]; [3-0-0]
- 503 (3) Advanced Occlusion and Articulation – Credit will not be given for both ORBI 501 and 503. [3-0-0]
- 504 (3-6) d Advanced Topics in Oral Microbiology
- 561 (2-6) d Directed Studies in Oral Biology
- 599A (12) Master's Thesis – Enrollment restricted to Graduate Students in Oral Biology.
- 649 Ph.D. Thesis

Oral Medical and Surgical Sciences OMSS

- 421 (2) Introductory Endodontics – Diagnosis, prevention, and treatment of pulpal diseases and injuries. [1-3-0]
- 422 (1) Principles of Medicine and Physical Diagnosis – Pathophysiology and clinical characteristics of diseases of the major systems and organs of the body and their relation to dental therapeutics. [2-0-0]
- 423 (1) Oral Diagnosis – An introduction to the diagnostic process: history-taking, physical examination, collecting and interpreting information, and treatment planning. [1-0-5-0; 0-1-0]
- 425 (2) Dental Pathology – Pathobiology of dental diseases. [1-0-0; 1-0-0]
- 426 (2) Introductory Oral Radiology – Theory and practice of dental radiography and an introduction to the principles of radiological interpretation. [0-0-1-1-0-1]
- 427 (1) Local Anaesthesia – Theory and practice of local anaesthetic administration. [1-0-0]
- 431 (2) Endodontics – Application of the basic principles of endodontics. (0-1-5-0; 1-1-5-0)

- 433 (3) Oral Medicine and Oral Diagnosis – Oral diagnosis, including orofacial pain and temporomandibular disorders. [1-3-0;1-3-0]
- 434 (4) Introduction to Oral and Maxillofacial Surgery [3-3]
- 435 (3) Oral Pathology – Pathobiology of oral diseases. [1-1; 1-1]
- 436 (1) Oral Radiology – Radiographic techniques and radiological interpretation with emphasis on extraoral techniques. [1.5-1.5]
- 437 (2) Pain and Anxiety Control [1-0-2]
- 441 (2) Advanced Endodontics [1-3-0;0.1.5-0]
- 443 (1) Oral Medicine, Oral Diagnosis, and Therapeutics [1-2-0]
- 444 (2) Advanced Oral and Maxillofacial Surgery [2-1.5]
- 446 (1) Advanced Oral Radiology and Oral Radiography
- 448 (2) Hospital Dentistry – Hospital protocol and procedures, physical examination, diagnosis, and treatment of the medically compromised dental patient, pain and anxiety control, and emergency care. [1-3-0]
- 513 (6) Oral Medicine I
- 516 (2) Oral Radiology
- 517 (6) Advanced Oral Radiology
- 523 (4) Oral Medicine II
- 545 (2) Oral Pathology
- 561 (1-6) d Directed Studies in Oral Medical and Surgical Sciences
- 599C (12) Master's Thesis – Enrollment restricted to Graduate Students in Oral Medical and Surgical Sciences.
- 703 Inter-relationship of Dental and Medical Specialities with Imaging Procedures
- 706 Forensic Odontology
- 712 Oral Surgical Pathology
- 713 Clinical Oral Medicine
- 715 Oral Radiographic Technique
- 716 Oral Radiology
- 717 Oral Radiological Interpretation
- 720 Review of Oral Radiology Literature
- 734 Clinico-Pathological Conferences
- 740 Clinical Dentistry
- 741 Specialty Rotations
- 742 Emergency Patient Management
- 743 Seminars on Hospital Dentistry
- 744 Directed Studies in Hospital Dentistry
- 750 Head and Neck Oncology
- 760 Oral Cytology
- 375 (3) Oral Medicine and Oral Diagnosis – Oral diagnosis, including orofacial pain and temporomandibular disorders. [1-3-0;1-3-0]
- 405 (3) Introduction to Curriculum Development in the Primary Program – An introduction to curriculum development in the primary program with reference to recent research, curriculum trends, social and cognitive development and issues in primary education. [3-0]
- 415 (3) Introduction to Instruction in the Primary Program – An introduction to planning and implementing learning experiences in the primary program: resources, materials, guidance, curriculum integration, evaluation, scheduling, classroom design, and management. [3-0]
- 425 (3) Advanced Studies in Curriculum Development: Non-Graded Primary Program – The development, organization, and implementation of non-graded integrated primary programs with an emphasis on the individualization of instruction and the continuous progress of students. Implications of recent research on non-graded programs are considered in the context of educational practice. Prerequisite: ECED 405. [3-0]
- 433 (3) Kindergarten Curriculum – The development of kindergarten programs with reference to recent research, theories of early learning, curriculum trends and practices, and the place of kindergarten in contemporary education. [3-0]
- 438 (3) Observation and Recording – Methods of observing and recording children's behaviour in early childhood settings. [3-0]
- 443 (3) Kindergarten Instruction – Planning and implementing kindergarten programs with reference to learning experiences, resources, materials, instruction, curriculum integration, evaluation, scheduling, and classroom design. [3-0]
- 508 (3-12) c Review of Research in Educational Methods – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 561 (3-12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3-12) c Problems in Education – Investigation and report of a problem
- 585 (3-6) d Advanced Seminar on Research in Early Childhood Education Prerequisites: Any 12 credits of ECED 333, 334, 336.
- 590 (3) Graduating Paper.
- 598 (3-12) c Field Experiences – For those on Master's, Doctoral and Diploma programs.
- 599 (6/12) c Master's Thesis
- 100 (6) Principles of Economics – The institutions and processes involved in the production and distribution of wealth: the functioning of the market, monetary and fiscal policy, and international trade theory. The course also provides an introduction to Canadian economic institutions and policy (e.g., labour unions, the Bank of Canada, anti-combines policy, tariffs, the Government's budget, taxation). ECON 100 is a prerequisite of all courses in Economics except ECON 308 and 309, and is a required course for all students taking a Major or Honours in Economics. Students in their third or fourth year who want a survey course in Economics are advised to take ECON 309. [3-0; 3-0]
- 201 (3) Intermediate Microeconomics I – Consumer behaviour, exchange, production and cost, equilibrium of the firm under different market structures, industry equilibrium. Prerequisites: ECON 100 and MATH 140 or equivalent. Credit may be obtained for only one of ECON 201 and 206. [3-0]
- 202 (3) Intermediate Macroeconomic Analysis – Income and employment theory, monetary theory, the open economy, economic fluctuations and growth. Prerequisites: ECON 100 and MATH 140 or equivalent. Credit may be obtained for only one of ECON 202 and 307. [3-0]
- 206 (3) Intermediate Microeconomics I – Consumer behaviour, production and cost, behaviour of the firm under different market structures, industry equilibrium. An intensive version of ECON 201. Intended primarily for prospective honours and other qualified students. Prerequisites: at least 68% in ECON 100 or 309, and an average of at least 68% in MATH 140 and 141, or their equivalent; or permission of the Department. Credit may be obtained for only one of ECON 201 and 206. [3-0]
- 301 (3) Intermediate Microeconomic Analysis – Consumer behaviour, production, exchange, theory of the firm under different market structures, factor markets, welfare economics. This course is intended for graduate students primarily in the Faculty of Commerce and Business Administration. Other graduate students may be admitted with the permission of the instructor. Not open to undergraduates. [3-0]
- 302 (3) Intermediate Macroeconomic Analysis – Income and employment theory, monetary theory, the open economy, economic fluctuations and growth. This course is intended for graduate students primarily in the Faculty of Commerce and Business Administration. Other graduate students may be admitted with the permission of the instructor. Not open to undergraduates. [3-0]
- 303 (3) Intermediate Microeconomics II – Factor markets, general equilibrium, uncertainty and information, contract theory, externalities, public goods, welfare. Prerequisites: ECON 201 or 206, and MATH 141 or equivalent. [3-0]
- 306 (3) Intermediate Microeconomics II – Factor markets, general equilibrium, uncertainty and information, contract theory, externalities, public goods, welfare. An intensive version of ECON 303. Intended primarily for prospective honours and other qualified students. Prerequisite: at least 68% in ECON 206, or permission of the Department. Credit may be obtained for only one of ECON 303 and 306. [3-0]
- 307 (6) Macroeconomic Analysis – Income and employment theory, monetary and fiscal theory, the open economy, economic fluctuations, inflation and unemployment, growth theory, macro dynamics, rational expectations, and macro policy analysis. Intended for qualified students pursuing an Honours degree in Economics. Prerequisite: at least 68% in ECON 100 or 309; and an average of at least 68% in MATH 140 and 141, or their equivalent. Corequisite (to be taken in the fall term if not completed earlier): ECON 201 or 206. This course is normally taken in the third year. Credit may be obtained for only one of ECON 202 and 307.

Early Childhood Education ECED FACULTY OF EDUCATION

- 333 (3) Prekindergarten Curriculum – The development of prekindergarten programs with reference to recent research, theories of early learning, and curriculum trends and practices. [3-0]
- 334 (3) Home, School, and Community Relations – Philosophy, history, and problems of the parent-teacher partnership; development of effective cooperation through individual parent-teacher conferences and parent-group discussions; examination of community services and inter-professional relationships on behalf of children. [3-0]
- 336 (3) History of Early Childhood Education – Political and social factors which influenced movements and trends in early childhood education in North America, prekindergarten through primary. [3-0]
- 343 (3) Prekindergarten Instruction – Planning and implementing prekindergarten learning experiences: resources,

Earth Science EARTH FACULTY OF SCIENCE

- 100 (3) Introduction to Planet Earth – Discovering the surface, interior and history of the Earth through the observations which have revealed them. The principal physical, chemical and biological processes which determine the dynamics of our planet's sub-systems and their interactions on a wide range of space and time scales. Earth Systems science, Gaia and Global Change. Credit may not be obtained for both this course and GEOL 100, CEOP 120, GEOG 101 or GEOG 102. Corequisites: MATH 100, PHYS 101 and CHEM 110 or 121. [0-0-0;3-3-0]

Economics ECON FACULTY OF ARTS

Many courses in Economics have a Mathematics prerequisite of Mathematics 140 (or equivalent) and/or Mathematics 141 (or equivalent). Courses equivalent to Mathematics 140 as a prerequisite are Mathematics 100, 111, 120 and 153. For Mathematics 141 the equivalents are Mathematics 101, 121 and 154.

- 308 (3) Principles of Microeconomics – An introduction to the functioning of the market system; concepts of supply and demand; behaviour of the consumer and the firm; the role of prices. Particular emphasis will be given to applications of theory to contemporary issues. Open to students in the Master of Health Administration program and to other graduate students with permission of the instructor. Credit may be obtained for only one of ECON 100, 308, and 309. [3-0; 0-0]
- 309 (6) Principles of Economics – The scope of this course is approximately the same as that of ECON 100. It differs in that it deals with fewer topics in greater depth, relating theory to contemporary economic issues. It is open only to third- and fourth-year students. Prerequisite: third- or fourth-year standing. Credit may be obtained for only one of ECON 100, 308 and 309. [3-0; 3-0]
- 312 (3) Political Economy of Capitalism – An intellectual history of the evolution of the capitalist system and its institutions; a selection of defences and criticisms of capitalism and its alternatives in the writings of leading social and political philosophers from the 18th to the 20th centuries. Prerequisite: ECON 100 or 309. [3-0]
- 313 (3) Marxist Economics – Marxist critiques of capitalist systems and Marxian alternatives. The origin of exploitation: feudalism and capitalism; exploitation and profits; the morality of exploitation; the emergence of class; historical materialism; Marxist theories of imperialism; and public ownership of the means of production. Prerequisite: ECON 100 or 309. [3-0]
- 317 (3) Poverty and Inequality – Economic inequality in Canada and other countries; measurement and causes. Inequality in the distribution of wealth; redistribution of income and wealth; notions of distributive justice. Prerequisite: ECON 100 or 309. [3-0]
- 319 (6) 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. Prerequisite: ECON 100 or 309. [3-0; 3-0]
- 320 (3) Introduction to Mathematical Economics – Application of single and multivariable calculus to economics. Includes comparative static analysis of household and firm behaviour as well as simple dynamic models. Prerequisites: ECON 100 or 309; also MATH 140 and 141, or their equivalent. [0-0; 3-0]
- 325 (3) Introduction to Empirical Economics – Essentials of probability and statistics for applied work in economics. Topics include descriptive statistics, probability, estimation, hypothesis testing, and analysis of variance. (See the 'Probability & Statistics' course listings in the calendar for credit restrictions with respect to ECON 325.) Prerequisites: ECON 100 or 309 (may be taken concurrently); also MATH 140 and 141, or their equivalent. [3-2; 0-0]
- 326 (3) Methods of Empirical Research in Economics – Techniques of empirical economic research. Topics include simple and multiple regression, time series analysis, and simultaneous equation estimation. Students will be required to undertake applied work. Prerequisite: ECON 325. Credit may be obtained for only one of ECON 326 and STAT 306. [0-0; 3-2]
- 334 (6) Economic History of 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. Prerequisite: ECON 100 or 309. [3-0; 3-0]
- 336 (6) Economic History of Canada – The growth of the Canadian economy in relation to development of natural resources, changing market conditions, industrialism, communications, and technology. Prerequisite: ECON 100 or 309. [3-0; 3-0]
- 339 (3) Economics of Technological Change – Application of economic analysis to technological change; the impact of technological change on the growth and distribution of income; economic influences on the invention and diffusion of technology: the interaction between technology, work, skills, and education; public policy toward technological change. Prerequisite: ECON 100 or 309. [3-0]
- 341 (3) Economic Development of Asia – Economic development under colonialism, the colonial legacy, population, trade and development, land reform, the Green Revolution, industrialization strategies, distribution of the gains from development. Each topic is discussed in the context of an Asian country. Prerequisite: ECON 100 or 309. [3-0]
- 342 (3) The Economy of China since 1949 – The Maoist strategy of development, the commune system and rural development, the pace and pattern of industrialization, management and planning, incentive policy, economic lessons from China. Students who wish to contrast different approaches to development may find it useful to take ECON 341 and 342 as a sequence. Prerequisite: ECON 100 or 309. [3-0]
- 343 (3) The Economic Development of Modern Japan – An economic analysis of the growth and structural changes of the Japanese economy from the Meiji Restoration to the Second World War. Sources of growth, the development of new economic institutions, agricultural development, international trade and early industrialization, the emergence of a dual economic structure, war preparation, and the drive towards heavy industrialization. Prerequisite: ECON 100 or 309. [3-0]
- 345 (6) Money and Banking – Financial markets and financial institutions in theory and practice; structure and development of the Canadian financial system; development and theory of the regulation of the financial system; process of monetary control; theory and history of central banking and monetary policy; the international financial system. Prerequisite: ECON 100 or 309. [3-0; 3-0]
- 350 (3) Public Finance Policy Topics – Examination of two or three selected policy problems from areas of taxation, income security, and public expenditures. Topics to be selected each year from areas of current or recent policy debate. Examples include public pension policy, privatization and public services, income tax or sales tax reform, federal-provincial cost sharing programs, tax incentives versus direct expenditures, welfare reform. Prerequisite: ECON 100 or 309. [3-0]
- 351 (3) Women in the Economy – Economic analysis of markets and policies particularly affecting women. Selected topics drawn from economic discrimination; educational, occupational, and work choices; pay and employment equity; allocation of work time and consumption within the household and in the market; economics of marriage and fertility; poverty; taxation; income security and pension policies; and historical perspectives. Prerequisite: ECON 100 or 309. [3-0]
- 355 (3) International Economics – Introduction to international trade and finance, with an emphasis on international economic policy. Topics include the determinants of trade, balance of payments, and selected policy issues (which may vary from year to year) such as tariff and non-tariff barriers to trade, bilateral and multilateral trade disputes, trade liberalization, trade and development, capital mobility, political economy of protection, and exchange rate policy. Credit may be obtained for only one of ECON 355 and 455. Prerequisite: ECON 100 or 309. [3-0]
- 360 (3) Labour Economics – A study of the Canadian labour market. Labour supply, the allocation of the time among work and non-market activity, participation in the labour force, education and training, The demand for labour. The determination of wages and employment. The effect of unions on wages and employment. The wage structure, wage differentials by occupation, industry, race and sex. Unemployment. Prerequisite: ECON 100 or 309. Credit may be obtained for only one of ECON 360 and 460. [3-0]
- 361 (3) Economics of Industrial Relations – Economic aspects of industrial relations in Canada. Why workers join unions. The theory of trade union behaviour. The labour movement in Canada. Wage determination under collective bargaining. The causes of strikes and lockouts. Unions and the wage structure. Prerequisite: ECON 100 or 309. Credit may be obtained for only one of ECON 361 and 461. [3-0]
- 365 (3) Topics in Canadian Industrial Organization and Regulation Policy. – Current topics in industrial organization and regulation with emphasis on Canadian federal and provincial policy. The content will differ from year to year. Possible subjects include the regulation of transportation and communications, environmental regulation, marketing boards and other forms of agricultural regulation, competition and anti-combines policy, industrial organization and trade policy, and issues in consumer protection. Prerequisite: ECON 100 or 309. [3-0]
- 367 (3) Economic Analysis of Law – The economics of market failure, equity and efficiency. Property rights, the economics of accident and contract law, economic theories of law enforcement. Prerequisite: ECON 100 or 309. [3-0]
- 370 (3) Benefit-Cost Analysis and the Economics of Project Evaluation. – Techniques and problems in benefit-cost analysis of public projects. Examination of alternative approaches to public decision-making such as cost-effectiveness analysis and multiple-objective frameworks. Case studies of projects in the areas of natural resources, the environment, human resources, public services, and transportation. Prerequisite: ECON 100 or 309. [3-0]
- 371 (3) Economics of the Environment – Economic analysis applied to various environmental issues, including sustainable development, quality of life, and environmental impacts of specific industrial and consumption activities. The design and implementation of government policies. Global environmental effects of human economic activity. Prerequisite: ECON 100 or 309. [3-0]
- 374 (3) Land Economics – Economic analysis applied to problems of land use. Rent theory. Land valuation. Land conservation. Techniques for assessing economic efficiency of land use. Effects of institutions and public policies on land use. Prerequisite: ECON 100 or 309. [3-0]
- 384 (3) Economic Analysis of Health Services – Microeconomic theory of resource allocation with emphasis on the applications of optimizing models of health service markets. Analysis of Canadian problems in health service supply. Models of the consumer/patient, the physician/entrepreneur, the not-for-profit hospital/firm, and the third-party regulatory and payment agency. Prerequisite: ECON 308, 100 or 309. [3-0]
- 387 (3) The Soviet Economy – Pre-revolutionary economic development, industrialization debate, economic development under Stalin. The centrally planned system, the role of plan and prices, resource allocation, sectoral problems (agriculture, foreign trade). The growth record, economic reform, management and innovation, imported capital. Prerequisite: ECON 100 or 309. [3-0]
- 406 (3) Topics in Microeconomics – Selected topics in advanced microeconomic analysis. Prerequisites: ECON 201 or 206 or 301, and 303 or 306. [3-0]
- 407 (3) Topics in Macroeconomics – Selected topics in advanced macroeconomic analysis. Prerequisites: ECON 201 or 206, and 202 or 307, and 303 or 306. [3-0]
- 417 (3) Welfare Economics – The criteria for evaluating economic performance with special reference to the problems of justice in the distribution of income and economic efficiency. Topics include social evaluation functions, pareto-optimality, compensation criteria, and consistency of collective decision making. Prerequisites: ECON 201 or 206 and 303 or 306. [3-0]
- 420 (3) Optimization and Economic Theory – An introduction to static and dynamic optimization methods with economic applications. Prerequisites: ECON 201 or 206, and 303 or 306; MATH 200 and 221; or permission of the instructor. [3-0]

- 421 (3) Topics in Mathematical Economics – Selected topics in mathematical economics such as general equilibrium theory and game theory. Prerequisite: ECON 420 or permission of the instructor. [3-0]
- 422 (3) Mathematics for Economists – Provides the required preparation in mathematics for the study of graduate economic theory. Solving systems of simultaneous equations; unconstrained and constrained maxima; elementary theory of difference and differential equations. Restricted to students taking graduate economic theory courses. [3-0; 0-0]
- 425 (3) Introduction to Econometrics – Theoretical and applied issues in statistics and econometrics. Statistical distributions, sampling theory, maximum likelihood methods of estimation and hypothesis testing, generalized least squares, measurement errors, non-normal errors, systems of equations, discrete-choice models, outliers, regression diagnostics, and model selection. Prerequisites: ECON 325 and 326. [3-0]
- 426 (3) Econometric Analysis – Further topics in econometrics including such areas as nonlinear estimation, distributed lag models, time-series analysis, time-varying parameters, multivariate analysis, simulation and forecasting models, Monte Carlo experiments, duration models, large econometric models, Bayesian statistics, asymptotic theory, and ergodic theory. Prerequisite: ECON 425. [3-0]
- 437 (6) Economic History of the United States – An economic analysis of basic issues in the development of the United States from the Colonial Era to the present. Examination of some of the recent challenges to the orthodox interpretation of U.S. economic growth. Prerequisites: ECON 201 or 206, and 202 or 307; or ECON 334 or 336; Major and Honours students in History who do not meet these prerequisites may be admitted with permission of the instructor. [3-0; 3-0]
- 440 (6) Economic Development and International Poverty – Theories of economic development with particular reference to underdeveloped economies; explanations for persistent poverty; problems of carrying out development programs; relationships between rich and poor countries. Prerequisite: ECON 201 or 206. [3-0; 3-0]
- 444 (3) The Contemporary Japanese Economy – An economic analysis of selected issues in contemporary Japan. The postwar growth record, economic management and planning, industrial policy, labour market and industrial relations, foreign trade and investment, rapid industrialization and its consequences, external economic relations. Prerequisite: ECON 201 or 206. [3-0]
- 447 (3) Monetary Theory – Theoretical analysis of economies that use money. Topics may vary from year to year and may include the emergence of money from barter; the roles of money in the economy; models of money demand; the optimal quantity of money seignorage and inflation; monetary policy and macroeconomic stability; monetary policy issues in an open economy. Prerequisites: ECON 201 or 206, and ECON 202 or 307. [3-0]
- 450 (3) Economics of Taxation – The economic analysis of taxation. Equity and efficiency; optimal taxation theory; partial and general equilibrium analysis of incidence; analysis of taxes such as the personal and corporate income taxes, sales and excise taxes, payroll taxes and property tax. Prerequisite: ECON 201 or 206. [3-0]
- 451 (3) Economics of Public Expenditures – The role of government in the economy; efficiency and economic justice. Theory of public goods; applications to topics such as education, medical care and social services. Pricing and investment rules for public enterprises. Prerequisites: ECON 201 or 206, and 303 or 306. [3-0]
- 455 (3) International Trade – International trade theory and policy, primarily using general equilibrium analysis. Topics include the role of relative costs, factor proportions, returns to scale and imperfect competition in determining the pattern of trade; efficiency and distribution Prerequisite: ECON 201 or 206. [3-0]
- 456 (3) International Macroeconomics and Finance – Balance of payments; market for foreign exchange; mechanism for adjusting the balance of payments; internal vs. external stability; current problems and issues. Prerequisite: ECON 202 or 307. [3-0]
- 457 (3) Seminar in International Economic Relations – Selected topics focusing upon various issues arising in international economic relations. Open only to fourth-year students in the Major program in International Relations. Prerequisite: ECON 100 or 309. [3-0]
- 460 (3) Economics of Labour Markets – The theory of labour supply and demand for individuals, households, and firms. Policy implications for Canada of guaranteed annual incomes, taxes on income, unemployment insurance, Canada Pension and other benefit programs. Employee selection, hiring, and promotion. Prerequisites: ECON 201 or 206, and 202 or 307, and 303 or 306. (Credit may not be obtained for both ECON 360 and 460.) [3-0]
- 461 (3) Economics of Trade Unions – The sources of union power. Union wage and employment policy. Bargaining theory. The influence of unions on relative wages. The effect of unions on the general level of prices and wages. Inflation, unemployment, and trade unions. Industrial disputes. The theory of third-party settlement of industrial disputes: conciliation, mediation, and arbitration. Prerequisites: ECON 201 or 206, and 202 or 307, and 303 or 306. (Credit may not be obtained for both ECON 361 and 461.) [3-0]
- 465 (3) Market Structure – Market structure and social welfare, theory of price discrimination, equilibrium in oligopolistic markets, entry and exit decisions, product differentiation and spatial models, theories of hierarchical organization, agency problem in the modern corporation, vertical integration and control, market structure and technical progress. Prerequisites: ECON 201 or 206, and 303 or 306. [3-0]
- 466 (3) The Economics of Government Regulation of Business – Normative and positive theories of government regulation of business. Topics include natural monopoly, socially optimal monopoly pricing, regulation of multifirm industries, competition policy. Selected empirical studies. Prerequisites: ECON 201 or 206, and ECON 303 or 306, or permission of the instructor. [3-0]
- 471 (3) Economics of Nonrenewable Resources – Application of economic analysis to the management of nonrenewable natural resources. Emphasis is placed on the economics of alternative energy sources. Other topics include mineral economics, criteria for the optimal use of resources, and measurement of. Prerequisite: ECON 201 or 206. [3-0]
- 472 (3) Economics of Renewable Resources – Application of economic analysis to the management of renewable resources. Special attention is given to criteria for the optimal use of depleting resources such as forests and water. Other topics include public policy with regard to environmental quality, conservation, and outdoor recreation. Prerequisite: ECON 201 or 206. [3-0]
- 480 (3) Transportation – Economic characteristics of the provision of transportation services, both passenger and freight; the market structure of the industry and the economic impact of the varying degrees of public regulation and promotion within the industry; the role of economic analysis in resolving problems of Canadian policy. Prerequisites: ECON 201 or 206; also 325 and 326, or COMM 290 and 291. [3-0]
- 487 (3) Comparative Economic Systems – Economic analysis of non-market/non-price systems of resource allocation. Economic analysis of central planning, co-ordination problems in hierarchical organizations, and the role of quantity restrictions, quotas, standards, etc. in regulating economic behaviour. The Soviet system of economic planning is used throughout as an example of the issues discussed. Prerequisite: ECON 201 or 206. [3-0]
- 490 (6) Applied Economics – The application of economic analysis to selected problems and issues. Restricted to economics Majors in fourth year, for whom it is compulsory. Prerequisites (which may not be taken concurrently): ECON 201 or 206, and 202 or 307, and 303 or 306; also ECON 325 and 326. [3-0; 3-0]
- 492 (3/6) c Directed Reading
- 495 (6) Honours Seminar – Reports and group discussions of selected topics. Open only to Honours students in Fourth Year. [2-0; 2-0]
- 499 (6) Honours Essay – Essay on some theoretical, applied, or institutional problem. Open only to fourth-year Honours students.
- 500 (3) Microeconomics
- 502 (3) Macroeconomics
- 514 (3) Information and Incentives
- 515 (3) Special Topics in Microeconomic Theory
- 516 (3) Special Topics in Macroeconomics
- 517 (3) Social Evaluation, Social Choice, and Economic Performance.
- 518 (3) History of Economic Analysis I
- 519 (3) History of Economic Analysis II
- 520 (3) Mathematical Economics I
- 521 (3) Mathematical Economics II
- 522 (3) Economic Applications of Game Theory
- 526 (3) Probability and Statistics for Use in Economics
- 527 (3) Econometric Methods of Economic Research
- 528 (3) Econometric Theory
- 529 (3) Topics in Theoretical Econometrics – The course content will vary from year to year, and may include, for example, time series models (both the RIMA and ARMAX models), spectral analysis, time varying parameters, the econometrics of rational expectations, latent variables, and random coefficients models. Prerequisite: ECON 527 or equivalent.
- 530 (3) Topics in Applied Econometrics – The course content will vary from year to year, and may include, for example, issues involved in the formulation and estimation of macroeconomic models, consumer demand models, labour supply functions, and cost and profit functions. Students will complete a major empirical project. Prerequisite: ECON 527 or equivalent.
- 531 (3) Economic History of Modern Europe
- 532 (3) Economic History of North America
- 541 (3) Economic Development I
- 542 (3) Economic Development II
- 546 (3) Monetary Theory and Policy I
- 547 (3) Monetary Theory and Policy II
- 550 (3) Government Finance: Expenditures
- 551 (3) Government Finance: Revenues
- 553 (3) The Economics of Income Security
- 555 (3) International Economics I
- 556 (3) International Economics II
- 560 (3) Economics of Labour
- 561 (3) Topics in Industrial Relations
- 565 (3) Market Structure and Business Behaviour
- 566 (3) Business Performance and Public Policy
- 567 (3) Organization Theory and Nonmarket Allocation – Internal organization and reasons for existence of firms; vertical integration; separation of ownership and control in the modern corporation; stock-market takeovers; incomplete contracts; hierarchical and other forms of organization; employer/employee relations. [3-0]
- 571 (3) Economic Analysis and Natural Resources I
- 572 (3) Economic Analysis and Natural Resources II
- 574 (3) Special Topics in the Economics of Resource Use

- 580 (3) Social and Economic Measurement
- 581 (3) Cost-Benefit Analysis – Techniques and problems in cost-benefit analysis. The evaluation of public and private projects. Topics may include shadow pricing, discounting and present-value calculations, surplus measurement, valuation of non-marketed goods and bads, value judgments in social cost-benefit analysis, and the evaluation of projects involving uncertainty, loss of life, and/or population change. [3-0]
- 587 (3) Comparative Economic Systems
- 590 (2-6) d Special Advanced Course
- 592 (2-6) c Directed Reading
- 594 (6) Applied Economics
- 595 (0) Major Essay
- 599 (6/12) c Master's Thesis
- 600 (3) Microeconomics I
- 601 (3) Microeconomics II
- 602 (3) Macroeconomics I
- 603 (3) Macroeconomics II
- 640 (3) Ph.D. Research Seminar – Open to qualified students working primarily toward a thesis prospectus. Students will present regular progress reports on their research.
- 690 (2-6) d Workshops in Economics – Workshops on current research topics will be offered in several fields in economics each year. Advanced graduate students may enrol in workshops for credit with permission of the workshop chairman. A list of workshops offered each year is available from the office of the Department.
- 699 Ph.D. Thesis
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- Education** **EDUC**
FACULTY OF EDUCATION
- Counselling Psychology:** Counselling Psychology (CNPS)
- Curriculum Studies:** Art Education (ARTE), Business Education (BUED), Computing Studies in Education (CSED), Curriculum Studies (CUST), Home Economics Education (HMED), Mathematics Education (MAED), Music Education (MUED), Physical Education (PETE), Science Education (SCED), Social Studies Education (SSED), Technology Studies Education (TSED).
- Early Childhood Education:** Early Childhood Education
- Education Curriculum and Instruction Studies:** Education Curriculum and Instruction Studies (EDCI)
- Educational Psychology and Special Education:** Educational Psychology and Special Education (EPSE)
- Educational Studies:** Administrative Adult and Higher Education (AAHE), Adult Education (ADED), Educational Administration (EADM), Educational Studies (EDST), Higher Education (HIED)
- Language Education:** English Education (ENED), Language Education (LANE), Modern Language Education (MLEE), Reading Education (READ), Teacher Librarianship (LIBE)
- 140 (3) Introduction to Native Indian Studies – Selected issues affecting B.C. Indians; the cultural and historical antecedents to these issues; Indian viewpoints towards these issues. The course draws from various disciplines as well as from the knowledge of Indian resource people. [3-0]
- 141 (3) Cultural Studies – The study of a native Indian cultural group with an emphasis on traditional values and practices related to education. (For students in the Native Indian Teacher Education Program only.) [3-0]
- 143 (0) Seminar and School Observation – Group guidance, counselling, and orientation to teaching, including half day observation in schools. [0-2]
- 240 (3) Issues in Native Indian Education – Selected issues in Indian education; the relation of these issues to the past; Indian viewpoints towards these issues; introduction to the evaluation and adaptation of teaching resources related to native Indians. [3-0]
- 244 (0) Seminar and Classroom Observation – Implications of cultural studies for classroom organization and practices. Orientation to Indian educational practice, including some half day school observation and a 3 week May practicum. [0-2]
- 306 (3) Curriculum and Instruction in Health Education – School health promotion programs and policies; child and adolescent health knowledge, attitudes, and behaviours; curriculum planning; teaching methods and strategies for grades K-12. [3-0]
- 310 (4) Principles of Teaching: Elementary – Introduction to principles and instructional procedures related to classroom management, instructional planning, and the assessment of learning as applicable across grade levels and subject matter fields. [2-4]
- 311 (4) Principles of Teaching: Secondary – Introduction to principles and instructional procedures related to classroom management, instructional planning, and the assessment of learning as applicable across grade levels and subject matter fields. [2-4]
- 315 (0) Pre-practicum Experience – Observation and instruction in educational settings. [0-4]
- 316 (3) Communication Skills in Teaching – Study and practice of communication skills in educational settings. Candidates will be required to demonstrate satisfactory oral communication abilities. [1-3]
- 319 (0) Orientation School Experience: Secondary – A two-week sequence of observations and instructional assignments in a selected secondary school. Corequisite: EDUC 311.
- 321 (0) Orientation School Experience: Elementary – A two-week sequence of observations and instructional assignments in a selected elementary school. Prerequisite: EDUC 310.
- 329 (18) Extended Practicum: Secondary – A developmental program of teaching practice, normally in one B.C. secondary school. Candidates will teach the subjects for which they have been academically and pedagogically prepared. Prerequisite: All requirements set for Term I. [0-40]
- 339 (3) Canadian Studies in the School Curriculum – Designed to improve teaching about Canada by integrating material from several disciplines. Criteria for selecting content, materials, and teaching approaches. Examination of significant teaching issues. Prerequisite: 18 credits of senior course work from the Faculty of Arts list in Canadian Studies. [3-0]
- 342 (6) Teaching Native Languages in Elementary Schools – Strategies, materials and programs for teaching Native Indian Languages as first and second languages. Prerequisite: one of ENED 489, LING 200 or 400. Recommended pre- or co-requisite: ENED 486, LING 433. [3-0; 3-0]
- 345 (0) Native Curriculum Field Experience – Participation in the development and implementation of Native Indian curricula. Experience with appropriate implementation skills and strategies. This three-week May assignment is to a school or other Native educational setting. Orientation to this assignment during a weekly seminar. [0-1]
- 380 (3) Teaching Adventure Activities in the Outdoors – An interdisciplinary focus will be used in methodology and program planning for teaching adventure activities in an outdoor environment. Field trips will provide opportunity for practical experience. [1-4]
- 395 (3/6) d Regional Field Studies in Education – Directed study of a particular aspect of education in other countries and other cultures. Each field study will consist of a balanced program of study, travel, and community experience. Not offered on a regular basis. Prerequisite: 12 credits of course work approved by the Associate Dean (Teacher Education) as being appropriate to the particular study.
- 399 (0) Field Experience and Practice – For those undertaking postgraduate study in Education.
- 412 (3) Curriculum for Career Programs – Career-oriented curricula and curriculum design; the role of the teacher in implementing and supervising work experience programs. [3-0]
- 418 (18) Extended Practicum: Elementary – A developmental program of teaching practice, normally in one B.C. elementary school. Candidates will teach all subjects in the elementary curriculum. The assignment covers the full school term. Prerequisite: all requirements set to precede this practicum. [0-40]
- 420 (2) School Organization in its Social Context – The organization and administration of schools, including issues in governance, finance, and community and professional control and influence. [2-0]
- 432 (3/6) d The Supervision of Teaching – Recent research on teaching effectiveness. The analysis of teaching. Clinical supervision of teaching. Enrolment limited to persons with teaching or supervisory experience. [3-0]
- 440 (3/9) d Special Study in a Subject-Matter Field – Topics in a subject field relevant to secondary teaching and not covered in previous undergraduate work. Teacher Education Office approval is required. (Open only to secondary students admitted with an academic deficiency.) Not for credit toward a graduate degree or for undergraduate credit in an academic subject. The subjects are: Algebra (3), Biology (3), Botany (3), Canadian Studies (3), Chemistry (3), Clothing (3), Computer Science (3), Earth and Space Science (3), Family Life (3), Foods (3), Geography (3), Geometry (3), History (3), Industrial Education Internship (6), Physics (3), Social Studies (6), Zoology (3).
- 441 (3) Interdisciplinary Studies in First Nations Education – Historical, sociological, philosophical, and anthropological perspectives impacting First Nations education. [3-0]
- 442 (3) Pedagogy of First Nations Education – Pedagogical principles and practices suitable to First Nations students; methods of enriching the curriculum by including the cultural background of First Nations students. [3-0]
- 449 (3/6) c Supervised Study – This course is available only to outstanding students approved by the Associate Dean (Teacher Education) in their senior years to undertake a research investigation into a particular problem.
- 490 (3/6) d Special Studies in Education – Topics in education not covered in a course. A pilot course may be offered under this name for only one year and with permission of the Associate Dean (Teacher Education).
- 492 (6/12) d Critical Analysis of Teaching – A combined clinical and research-based examination of teaching which seeks to help teachers determine what kinds of teaching activities are appropriate to the context in which they are involved. Teaching practice in a public elementary or secondary school is an integral part of this course.
- 495 (4-18) c Teaching Practicum (Elementary) – Supervised teaching in a B.C. elementary school. For qualified teachers wishing to strengthen or expand areas of teaching competence and for those not enrolled in a full program of teacher education but requiring between 3 and 15 weeks of current teaching practice. Prerequisite: completion of recent elementary teaching methods courses in the subjects to be taught.
- 496 (4-18) c Teaching Practicum (Secondary) – Supervised teaching in a B.C. secondary school. For qualified teachers wishing to strengthen or expand areas of teaching competence and for those not enrolled in a full program of teacher education but requiring between 3 and 15 weeks of current teaching practice. Prerequisite: recent completion of secondary teaching methods courses in the subjects to be taught.

- 497 (0) Elementary Program (One-year Graduate Transfers and B.Ed. [Special Education] Students) - Seminar and Student Teaching - Seminars as arranged. Periods of teaching practice in the first and second terms plus a minimum of three weeks post-session practicum in elementary schools. Demonstration lessons and field trips as arranged. Individual assistance from faculty adviser.
- 500 (3) Research Methodology in Education. -- Overview of methodological approaches to research in education.
- 500 (3) Research Methodology in Education
- 566 (6) 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.
- 601 (6/12) c Doctoral Seminar
- 699 Doctoral Thesis
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- Educational Studies**
DEPARTMENT OF EDUCATIONAL STUDIES,
FACULTY OF EDUCATION
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- Administrative, Adult and Higher Education AAHE**
- 508 (3-12) c Review of Research Methods In Administrative, Adult and Higher Education - Recent research bearing on educational practice. Prerequisite: EDUC 500 (Research Methodology in Education) or appropriate senior undergraduate introductory methods course. Maximum total credits for all Departmental 508 courses: 12.
- 531 (3) The Politics of Institutional Governance in Education - Political aspects of educational governance at various levels of government and in various institutional settings.
- 532 (3) Leadership in Educational Organizations
- 533 (3) Planning in Educational Organizations. - Strategic and other forms of planning in primary, secondary, higher and adult education. (3-0)
- 565 (3/6) d Special Course in Subject Matter Field - Courses in various subject matter fields designed to bring teachers up-to-date in recent findings in each field. Maximum total credits for all Department 565 courses: 6
- 601 (6) Doctoral Seminar - Required for students in the first year of a doctoral program.
- 602 (6) Doctoral Seminar - Required for students in the second year of a doctoral program. Prerequisite: AAHE 601.
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- Adult Education ADED**
- 313 (6) Organization of Adult Basic Education Programs - Rationale, structures, and functions of basic education completion. Prerequisite: third year standing. [3-0; 3-0]
- 314 (6) Adult Correctional Education - Planning prison education; methods and techniques as they are affected by historical, philosophical, structural, and organizational contexts of penal institutions. Prerequisite: third year standing. [3-0; 3-0]
- 327 (3) Instructional Techniques for Teaching Adults - Description, conditions for effective use, and applications to specific circumstances of various instructional techniques. Practical use of the techniques in settings of instruction for adults is emphasized. (Credit may not be obtained for more than one of ADED 412 or 327 and 328.) [3-0]
- 328 (3) Institutions of Adult Education - The history, roles, and activities of institutions in the field of adult education. Institutions in Canada, Great Britain, and the United States are emphasized, and some experiences in other countries are examined. (Credit may not be obtained for more than one of ADED 412 or 327 and 328.) [3-0]
- 329 (3) Developing Short Courses, Workshops and Seminars - Organization and administration of adult education events such as short courses, seminars, workshops, conferences and institutes. [3-0]
- 330 (3) The Community Practice of Adult Education - Community based adult education with particular emphasis on the application of knowledge of the social, economic, cultural and political environment in developing and conducting adult education programs with and for individuals and groups. [2-3]
- 375 (6) Diploma Seminar and Internship in Adult Education [2-3]
- 412 (6) Introduction to Adult Education - Survey of present programs for adult education including study of methods, institutions and conditions under which they have developed in modern society. Students may not obtain credit for more than one of ADED 412 or 327 and 328. [3-0; 3-0]
- 500 (3) Foundations of Adult Education - The philosophical and historical foundations of the field of adult education. Prerequisite: ADED 412.
- 501 (3) Adult Education and Society - The interrelationships of adult education and social, economic and political developments. Examination of research literature and policy issues. Prerequisite: ADED 500.
- 502 (3) History of Canadian Adult Education - Selected topics in the history of adult education in Canada, with some emphasis on British Columbia, and on the relationships between adult education and other factors influencing the development of Canadian society.
- 503 (3) International Dimension of Adult Education - International perspectives on policy formulation, allocation of resources, design and delivery of adult education throughout the world. Special emphasis on emerging educational innovations.
- 508 (3-12) c Review of Issues in Research Methods in Adult Education. - Recent research bearing on educational practice. Prerequisite: EDUC 500 (Research Methodology in Education) or appropriate senior undergraduate introductory methods course. Maximum total credits for all Departmental 508 courses: 12.
- 514 (3) Adult Education Program Planning Theory - Theoretical and conceptual perspectives on planning and evaluating educational programs for adults. Exploration of the theoretical basis and utility of various approaches to planning and evaluation. (Same as AGECE 514.)
- 515 (3) Adult Education Program Planning Practice - Application of planning and evaluation principles in specific adult education settings. Exploration of the practical utility of various approaches to planning and evaluation. Prerequisite: ADED 514. (Same as AGECE 515.)
- 516 (3) Administration of Adult Education Agencies - Selected organizational and administrative theories, processes and practices relevant to the management of adult education agencies. Administration of formal, nonformal and informal adult education.
- 518 (3) Theory and Research on Adult Learning - Critical examination of theory and research on adult learning in formal, nonformal and informal education settings.
- 519 (3) Theory and Research on Adult Instruction - Critical examination of theory and research on adult instruction in formal, nonformal and informal education settings. Prerequisite: ADED 518.
- 525 (3/6) d Educational Gerontology - The role of education for populations of older adults and for aging, research on cognitive development across the life-span, and studies of role transitions and adaptation in the later years are investigated from the perspective of life-span education. Prerequisites: PSYC 322 or ADED 412, and ADED 518.
- 561 (3-12) d Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field - Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3-12) c Problems in Education - Investigation and report of a problem.
- 583 (3/6) d Advanced Seminar in Adult Education - Discussion of various projects in research or organization carried out by students. Prerequisite: ADED 500, 514 and 518.
- 590 (3) Graduating Paper.
- 598 (3-12) d Field Experiences - For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 699 Doctoral Thesis
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- Educational Administration EADM**
- 500 (3) The Study of Organizations and Administrative Behaviour in the Educational Context
- 501 (3) Research and Research Traditions in Educational Administration
- 502 (3) Problem Analysis and Formulation Skills for Administration
- 505 (3) The Work of the School Principal
- 507 (3) Personnel Administration in Educational Organizations
- 508 (3-12) c Review of Research Methods in Educational Administration - Recent research bearing on educational practice.
- 517 (3) Supervision of Instruction
- 520 (3) Advanced Topics in the Study of Organizations and Administrative Behaviour in the Educational Context
- 522 (3) Advanced Problem Analysis and Formulation
- 553 (6) Seminar and Group Inquiry in Educational Administration
- 554 (3) Administration and Educational Policy Development
- 555 (3) Educational Finance
- 556 (3) Administration of the Educational Program
- 560 (3) School Law
- 561 (3-12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field - Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 567 (3) Computers and Educational Administration - Administrative applications of computers and their organizational implications in educational administration.
- 580 (3-12) c Problems in Education - Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3-12) c Field Experiences - For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 699 Doctoral Thesis
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- Educational Studies EDST**
- 314 (3) The Analysis of Education - Concepts, abilities, and procedures for assessing educational claims, policies, and practices. [3-0]
- 425 (3) Educational Anthropology - Selected concepts from educational anthropology for teachers. Comparative study of school and classroom culture, school teaching, and multicultural education. [3-0]
- 426 (3) History of Education - An examination of selected topics in the history of European, Canadian and American education and of the relationships between historical development and current educational policy. [3-0]
- 427 (3) Philosophy of Education - An introductory course in which consideration is given to the philosophical foundations of education and to the practical bearing of theory upon curriculum content and classroom practice in our schools. [3-0]
- 428 (3) The Social Foundations of Education - An application of the social sciences to the study of education. [3-0]

- 429 (3) Educational Sociology – Selected theories of society and schooling applied to Canadian education. [3-0]
- 468 (3/6) c Introduction to the Foundations of Values Education – Examination of the key concepts, knowledge and techniques produced by disciplines for the study of the theory and practice of values education. Insights provided by history, philosophy, sociology and psychology will be studied. [3-0; 3-0]
- 500 (3/6) c Readings in the History of Canadian Education
- 501 (3/6) c Readings in the History of American Education
- 502 (3/6) c Readings in the History of Childhood
- 503 (3) Curricula in Their Historical Context – An examination of selected topics in the history of the curriculum in Canada and elsewhere. (Same as EDCI 568)
- 504 (3/6) c Readings in the History of Educational Policy
- 505 (3) History of North American Native Education – Principal themes in Native Indian education in Canada and the United States from the first contact with Europeans to the present day.
- 507 (3/12) d Seminar in the History of Education
- 508 (3/12) c Review of Research in Educational Methods – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 523 (3/6) d 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: EDST 426, 427, 429.
- 524 (6) Advanced Seminar in Comparative Education
- 561 (3/12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 570 (3) Seminar in Sociology of Education – Examination of current research literature and theoretical issues in the area of the sociology of education. Prerequisite: EDUC 429.
- 573 (3) Sociology of the Curriculum – Curriculum in its social, economic, political and institutional contexts.
- 574 (3) Schoolteaching: An Occupational Analysis – Examination of teaching as an occupation utilizing the sociology of work perspective.
- 575 (3) Seminar on Work and Education – Examination of the relationship between the organization of work and the organization of schools. Education and economic inequality, education and economic growth, vocational education, the transition from school to work and career awareness education.
- 576 (3) Seminar on Women and Education – Analysis of the way education reflects and influences the position of women in society. Representation and portrayal of women in the curriculum, the impact of feminism on educational research and practice, the role of women as teachers and mothers, sex role socialization and education for work.
- 577 (3) The Social Context of Educational Policy – An examination of selected educational policies and their relation to the social contexts in which they arise emphasizing Canadian society.
- 578 (3) Multiculturalism, Race Relations and Education – Theoretical frameworks from the social sciences as they pertain to public education; various national policy responses to ethnic and racial pluralism, with particular reference to the relationship between education, ethnicity and public policy.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 587 (3) Social Philosophies and Education Prerequisite: EDST 427, 429.
- 590 (3) Graduating Paper.
- 591 (3/6) d Epistemological Foundations of the Curriculum – An inquiry into the nature and organization of knowledge. Implications for curriculum construction and classroom teaching. Prerequisite: EDST 427 or a senior level philosophy course.
- 592 (3/6) d The Conceptual Foundations of Teaching – Analysis and study of the informal logic of teaching activities. Prerequisite: EDST 427 or PHIL 250 or 302.
- 593 (3/6) d Ethical Foundations of Educational Thought and Practice – Inquiry into the nature of moral reasoning and its place in education. Implications for moral education, and the formulation of policy statements. Prerequisite: EDST 427 or a senior philosophy course.
- 594 (3) Philosophy of Educational Research – Philosophical analysis of the conceptual structures and research methodologies of current educational research programs. Prerequisite: EDST 427 or a senior philosophy course.
- 595 (3) Analysis of Educational Concepts – The theory and practice of conceptual analysis and its application in philosophy of education. Prerequisites: EDST 427 or a senior philosophy course.
- 596 (3/6) c Philosophy and Educational Policy – Philosophical examination of educational policy issues and the grounds relevant to their resolution. Prerequisite: EDST 426, 427, 429.
- 597 (3) Theories of Education – An examination of the theories of education of such theorists as Plato, Comenius, Pestalozzi, Herbart, Froebel, Dewey, Kilpatrick, Bruner, and Friere. Prerequisite: EDST 426, 427, 429.
- 598 (3/6) c Advanced Seminar in Philosophy of Education – Current trends in educational philosophy; social implications of current educational theories. Prerequisite: EDST 427, or a senior level philosophy course.
- 599 (6/12) c Master's Thesis
- 601 (3/6) c Doctoral Seminar – Required of students in the first year of a doctoral program.
- 602 (3/6) c Doctoral Seminar – Required of students in the second year of a doctoral program. Prerequisite: EDST 601. (To be graded as pass/fail.)
- 699 Doctoral Thesis
- philosophical roots of the community service orientation and means used to promote community development.
- 540 (3) The Community College Concept – A study of the history, philosophy and development of the community college idea in Canada, with particular reference to British Columbia.
- 541 (3) Community College and Institute Programs – The theoretical bases for program development in colleges and institutes with particular reference to academic, technological and vocational programs.
- 560 (3) Institutional Analysis and Planning in Post-secondary Institutions
- 561 (3/12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis

Education Curriculum and Instructional Studies EDCI FACULTY OF EDUCATION

- 363 (3) Interdisciplinary/Integrated Curriculum and Instruction – Theory and practice of interdisciplinary and integrated studies; instructional methods, materials, and plans; evaluation strategies. The specific curricular focus may vary. [3-0]
- 396 (3-12) d Curriculum Development and Evaluation – Practical and conceptual issues of developing and evaluating elementary and/or secondary school curricula will be discussed in relation to concurrent classroom pre-service or in-service experience.
- 487 (6) Recent Developments in Elementary Curriculum and Instruction – An examination of recent changes in the organization and curriculum of elementary schools. [3-0; 3-0]
- 488 (3) Key Curricular Orientations: Progressivism – Key concepts and practical implications of Progressive curricular orientations. [3-0]
- 508 (3-12) c Review of Research in Educational Methods – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 561 (3-12) c Laboratory Practicum
- 562 (3) Foundations of Curriculum – History and development of the curriculum emphasizing the underlying perspectives that inform curricular choices and activities; principles and issues related to organization, development and evaluation.
- 563 (3) Curriculum Evaluation – An examination of various concepts and methods pertinent to the evaluation of curricula. Prerequisite: EDCI 562.
- 564 (3) Curriculum Development – An examination of contemporary issues and research problems related to planned curriculum change and development.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 566 (3) Curriculum Change and Implementation – Theories of educational change, current research literature, and principles for planning and evaluating curriculum implementation.
- 567 (3/6) c Problems and Issues in Elementary Education – Recent developments, current issues, analysis and evaluation of research in elementary education.

Higher Education HIED

- 493 (3) Introduction to the Study of Higher Education – An introduction to the field of higher education in Canada and to British Columbia in particular. Topics to be studied will include the objectives of higher education, its historical development and current issues such as diversity of offerings, enrolment, accessibility, finance, and governance of these institutions. [3-0; 0-0] or [0-0; 3-0]
- 510 (3) Foundations for the Study of Higher Education – The historical, philosophical and socio-cultural factors which form the bases for the development of various institutions of post-secondary education in Canada.
- 511 (3) Organization and Administration of Higher Education – Organization theory applied to universities and colleges.
- 513 (3) Current Issues in Higher Education – Selected problems in the administration of various post secondary educational institutions. Prerequisites or corequisites: HIED 510, 511, 512.
- 521 (3) Organization and Administration of Higher Education – Organization theory applied to the administration of universities and colleges. Development of topics beyond those of HIED 511. Prerequisite: HIED 511.
- 522 (3) Human Resources in Higher Education – Policies and practices of developing and maintaining an effective faculty and staff in universities and colleges.
- 530 (3) Community Service Function of the Community College – The community college as a resource for the economic, social, cultural and political development of the communities which they serve. The historical and

- 568 (3) Curricula in Their Historical Context – An examination of selected topics in the history of the curriculum in Canada and elsewhere. (Same as EDST 505)
- 572 (3/6) d Advanced Seminar in Curriculum – Examination of current theories and practices in the curriculum field emphasizing factors affecting decision-making. The emphasis of the seminar will vary according to faculty and student interests and students will be encouraged to investigate an area of Prerequisite: EDCI 562, 563 or 564.
- 580 (3-12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper
- 598 (3-12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 601 (3-12) c Doctoral Seminar
- 699 Doctoral Thesis
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- Educational Psychology and Special Education**
EPSE
FACULTY OF EDUCATION
- 301 (3) Introduction to Educational Psychology [3-0]
- 303 (3) Introduction to Teaching the Gifted and Creative – This course is designed to help the teacher understand gifted and creative students and their special needs. Emphasis is placed on the identification, appraisal, principles and desirable conditions relating to the education of the gifted and creative student. [3-0]
- 306 (2) Education during the Adolescent Years – Developmental characteristics of persons from pre-school age through adulthood. Physical, social, cognitive, moral, and emotional growth of both normal and exceptional children in grades 8-12. The teacher's role in assisting such students to deal with major developmental issues and problems. [2-0]
- 312 (3) Introduction to the Study of Exceptional Children – An examination of all groups of exceptional children in terms of definition, incidence, characteristics, diagnosis and treatment. (Prerequisite to most other courses in Special Education. Can be taken concurrently with several other introductory courses in Special Education.) Prerequisite to most other courses in Special Education. Can be taken concurrently with several other introductory courses in Special Education.) [3-0]
- 313 (3) Educational Application of Developmental Theories – Theories of human development; physical, social, cognitive, moral, and emotional developmental characteristics from infancy to adolescence; implications for educational practice with students of different age and developmental status during the elementary school years. [3-0]
- 314 (3) Introduction to the Education of the Visually Impaired – An introductory course reviewing the identification and education of blind and partially-sighted children. Designed to aid teachers to accommodate visually impaired children in the regular class setting. Pre- or co-requisite: EPSE 312. [3-0]
- 315 (3) Language Disorders of Exceptional Children – The course deals with severe language disabilities in children. Emphasis is placed on theories of language acquisition as applied to assessment. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 316 (3) Specific Learning Disabilities – An introduction to the identification and assessment of basic motor, perceptual, and other disabilities in children. The course is directed toward children who have no readily-apparent learning disability but who are still not learning in school. Pre- or corequisite: EPSE 312 [3-0]
- 317 (3) Development and Exceptionality in the Regular Classroom – The teacher's role in dealing with major developmental and special educational issues and problems within the regular classroom program, including working with supportive services, parents, and communities. Designated sections will focus on early childhood, middle childhood or adolescence. Pre- or corequisite: EPSE 306 or 313. [3-0]
- 318 (3) Education of Adolescents with Disabilities – A study of the physical, psychological and sociological characteristics of adolescents with disabilities and their implications for program development and implementation. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 320 (3) Teaching Concepts to Students with Visual Impairment – Academic readiness and mastery of academic subjects by blind and other visually impaired children. Special curricula and methodologies designed to compensate for deficits in spatial and other visually based concepts. Development and application of curriculum materials in classroom settings in conjunction with teaching practical. (This course is restricted to students enrolled in a program for Education of Visually Impaired Children or those who hold the Diploma or its equivalent.) [3-0]
- 342 (3) Field Experiences with Individual Atypical Children – Supervised experience working with several atypical children in a community setting. Diagnosing needs, planning programs and integrating instruction and materials on an individual basis. Prerequisite: Subject to department approval. [1-9]
- 343 (3) Materials in Special Education: Developing Perspective – Focuses on the critical examination of published materials for use with exceptional children. Students will be expected to investigate, analyse and adapt materials to suit special educational circumstances. [3-1]
- 344 (3) Programming in Special Education: Developing Perspective – An examination of the range of educational methodologies and teaching procedures and a discussion of their implications for the establishment of programs useful in working with exceptional children. The course comprises a practical examination and a detailed comparison of the major special educational methodologies. [3-1]
- 345 (3) A Critical Review of Research in Special Education – Designed to assist the special education teacher in the process of critically reviewing the research literature in the areas of developmental and learning disabilities and behavioural/emotional problems. [3-1]
- 346 (3) Academic Curricula in Special Education: Developing Perspectives – Based on a practical examination of curricula used in special education focussing on both long and short term goals. Provisions will be made to accommodate a student's special interest area in the study of exceptional children. [3-1]
- 348 (3) Working with Parents of Children with Disabilities – The needs and problems of families with children with disabilities; the role of the family; the role of the teacher in relation to families; services provided for parents; parents' organizations and support groups. [3-1]
- 390 (3/6) d Special Topics – A study of innovative practices, ideas, and theories in special education. The specific topics may change yearly to reflect changing priorities and interests in special education, and the specific interest and competencies of visiting and regular faculty. Prerequisite: EPSE 312 or 317 and consent of the instructor. [3-0]
- 399 (3) Sign Language Seminar – Refinement of receptive and expressive skills in American Sign Language, fingerspelling, Pidgin Sign English, and manually coded English. Consideration of issues related to deafness and deaf culture. Participation in activities of the deaf community. (Subject to department approval.) [1-4]
- 401 (3) Instructional Design – Principles of instructional design and their application to the development, analysis, and evaluation of instructional plans for selected settings, instructional formats, and age groupings of learners. [3-0]
- 403 (3) Developmental Disabilities – Characteristics of children with developmental disabilities and/or serious developmental delays; overview of medical, legal, educational, and social provisions. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 406 (3) Education of Atypical Infants and Children – The effects of a range of individual disabilities on growth, development, and learning; principles and practices of early intervention, parent involvement, and parent education. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 408 (3) Programming for the Gifted and Creative – Planning suitable educational programs at both elementary and secondary levels for gifted and creative students. Prerequisite: EPSE 303. [3-0]
- 410 (3) Microcomputer Technology in Special Education and Rehabilitation – The use of microcomputers, adaptive technology, and software across age levels and areas of exceptionality in special education and health care settings. Prerequisite: EPSE 312 or 317. Pre- or co-requisite: CSED 402. [2-1]
- 415 (3) Technology for the Visually Impaired – Preparation of teachers to work with a variety of technological devices designed for students who are blind or visually impaired, e.g., computers, electronic reading devices, and closed circuit television. (This course is restricted to students enrolled in a program for Education of Visually Impaired Children.) [2-2]
- 418 (3) Career and Alternative Educational Programs for Students with Disabilities – A review of programs at the secondary and post-secondary level which develop the social and career-related skills for adolescents and adults with disabilities. Prerequisite: EPSE 312 or 317. [3-0]
- 419 (3) Introduction to Speech and Communication Disorders – A classroom teacher oriented survey of the natural development of speech and language as a basis for recognizing and understanding deviations from the normal. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 420 (3) Education of Children with Moderate Developmental – An examination of methodologies for assessment and education of students with moderate developmental disabilities/delays. Pre- or co-requisite: EPSE 312 or 317 and 403. [3-0]
- 421 (3) Assessment of Learning Difficulties – Theories of learning and instruction; principles and practices of diagnosis and assessment as these relate to students with relevant special needs. Prerequisite: EPSE 312 or 317 and EPSE 423. [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. [3-0]
- 423 (3) Learning, Measurement and Teaching – Theories of learning and instruction; principles and practices in the assessment of classroom learning. Prerequisite: EPSE 306 or 313. [3-0]
- 424 (3) The Stimulation of Language Development in Exceptional Children – The course is designed to acquaint teachers with the variety of approaches, programs, and methods for the remediation of severe language disorders in children. Prerequisite: EPSE 315. [3-0]
- 425 (6) Provisions in the Education of the Visually Handicapped – Provisions, procedures and methodology in the teaching of specific curriculum for the blind and visually impaired. Life skills and adjustment to blindness. (This course is restricted to students in a program Education of Visually Impaired Children.) [3-0]
- 426 (3) Principles of Teaching the Hearing Impaired – An introductory course reviewing methods of teaching, administration, and organization of the educational program for the hearing impaired. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 428 (3) 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. [3-0]

- 429 (3) Education of Children with Mild Developmental Problems – An examination of methodologies employed in assessment and education of students with mild developmental and/or learning problems. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 431 (3) Programming for Children with Specific Learning Disabilities – Methods and programs for learning disabilities are reviewed. Practical experience in the development and execution of a remedial program is required. Prerequisite: EPSE 316. [3-0]
- 434 (3/6) c Precision Teaching and Behaviour Management – A study of the rationale for precision teaching. The development of skills in measurement and planning implicit in precision teaching that enable teachers and pupils to increase their effectiveness in the classroom. Prerequisite: EPSE 301 or 423. [3-0; or 3-0]
- 435 (3) Introduction to the Study of Individuals and Group – An exploration of self awareness in relation to the classroom and other groups. [2-2]
- 436 (3) Behaviour Disorders in Children – Educational implications of the psycho-social maladjustment of children and adolescents. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 437 (3) Teaching Maladjusted Children – Techniques for educating maladjusted children. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 448 (3) Education of Children with Multiple Disabilities – The course explores a variety of teaching methodologies designed for children who combine sensory with motor and/or neurological disabilities. Pre- or co-requisite: EPSE 312 or 317. [3-0]
- 455 (3) Introduction to Orientation and Mobility for the Blind – Aims to acquaint teachers with an understanding of the process of teaching independent travel to blind students and assist teachers to incorporate orientation and mobility skills in school. (This course is restricted to students enrolled in a program for Education of Visually Impaired Children or those who hold the Diploma or the equivalent.) Pre- or co-requisite: EPSE 425. [2-2]
- 461 (3/6) c 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.
- 462 (3/6) c Human Development in Education – Investigates selected concepts of developmental theory in terms of their influence upon instructional practice. Particular emphasis is placed on social and intellectual development. Prerequisite: EPSE 306 or 313.
- 481 (3) Introduction to Research in Education – The nature of scientific study and essentials of survey, experimental and other empirical research designs. Designed for students proceeding to graduate work. [3-0]
- 482 (3) Introduction to Statistics for Research in Education – Basic concepts and principles of descriptive and inferential statistics. Designed for students proceeding to graduate work involving quantitative methodology. Prerequisite: Proficiency in modern high school algebra. [3-0]
- 483 (3) Statistics in Education – Topical survey of various statistical methods used in research in Education. Designed to prepare students to read literature of empirical research. May not be used as prerequisite to EPSE 592. [3-0]
- 484 (3) Nonparametric and Related Statistics – Distribution-free statistical techniques for analysis of ranked data, and analysis of discrete observations. Prerequisite: EPSE 482. [3-0]
- 501 (3) Educational Applications of Cognitive Psychology – Theory and research on cognitive approaches to learning, knowledge representation, memory, metacognition and problem solving. Applications to education in general and to specific school subject areas. Prerequisites: One of EPSE 301, 421, 423, PSYC 309, 310. May be taken concurrently with EPSE 481, 482 or EDUC 508.
- 502 (3) Cognition and Language Processes in Education Prerequisites: EPSE 501 and 592.
- 503 (3) Conceptual Learning and Instruction Prerequisites: EPSE 501 and 592.
- 505 (3/6) c Special Topics in Human Development and Instruction – Investigates a range of developmental topics and their curricular implications, including: stage models of social and cognitive development, competence in children and adolescents, the development of conceptions of space, time, number, causality and the developmental components of individual differences, etc. Prerequisite: A senior course in human development (e.g. PSYC 301, 414 or EPSE 306, 313), or demonstrated competence in developmental theory.
- 506 (3) College and University Teaching
- 507 (3) History of Special Education – A historical review of programs in special education in Europe and North America. Prerequisite: EPSE 312.
- 508 (3-12) c Review of Research in Educational Methods – Studies are made of recent research bearing on educational practice. Prerequisite: Appropriate senior undergraduate introductory or methods course.
- 509 (3) Organization of Special Education Services and School Psychological Consultations – Organization of special services and school psychological interventions for children and youth in school, home and community settings. Theory of and research in consultation; application of consultation in school settings; methodology for the evaluation of outcomes; psychological and special services delivery in schools. Prerequisite: EPSE 312 or 317.
- 510 (3-6) d Microcomputers in Special Education Prerequisite: EPSE 410.
- 512 (3) Problems and Issues in Special Education – An advanced seminar to examine selected trends, divergent perspectives and controversies in the field of special education. Prerequisite: At least 24 credits of special education courses.
- 513 (3) Seminar in the Education of Children with Developmental Disabilities Prerequisite: EPSE 420 or 429.
- 515 (3) Seminar on Behavioural Disorders and School-based Interventions Prerequisites: EPSE 436 and 437 and consent of the instructor.
- 516 (3) Seminar in the Education of the Creative and Gifted Learner
- 517 (3) Acoustic Environments and Amplification in the Classroom – Consultative and collaborative models for audiologists and educators planning rehabilitation programs for deaf and hard of hearing students. Individual and group amplification, cochlear implants, and acoustic environments. Pre- or co-requisites: AUDI 510 [3-0;0-0]
- 518 (3) Speech Development of Deaf and Hard of Hearing Students Pre- or co-requisites: EPSE 517.
- 519 (3) Development of English Language Skills of Deaf and Hard of Hearing Students Pre- or co-requisites: EPSE 518. Recommended Study: LING 350.
- 520 (3) Curriculum Development in the Education of Deaf and Hard of Hearing Students Pre- or co-requisite: EPSE 519.
- 521 (3) Psychosocial Aspects of Hearing Loss
- 522 (3) Designing English Language Programs for Deaf and Hard of Hearing Students Pre- or co-requisite: EPSE 519.
- 524 (3) Practicum in Speech Development with Deaf and Hard of Hearing Students
- 525 (3) Studies in Sign Language [3-0;0-0]
- 526 (3) Seminar in Specific Learning Disabilities – An advanced seminar on specific learning disabilities. The course stresses research findings in learning disabilities as they apply to description, diagnosis and programming. Students registered in this course are expected to be familiar with basic theoretical positions and methodologies concerning learning disabled individuals. Field work in applied research will be a course requirement. Prerequisites: EPSE 431 and 536 (EPSE 535 is also recommended).
- 527 (3) Practicum in English Language Development with Deaf and Hard of Hearing Students – Strategies and techniques for teaching English language to deaf and hard of hearing students; supervised practicum. Pre- or co-requisite: EPSE 522. [0-0;2-2]
- 528 (3) Basic Principles of Measurement Prerequisite: EPSE 482 or 483, plus an introductory course in measurement.
- 529 (3) Test Construction Prerequisite: EPSE 528.
- 530 (3) Seminar in Education of the Hearing Impaired – Review of recent educational, psychological and audio-logical research and intervention techniques in the field of hearing impairment. Prerequisite: EPSE 423.
- 533 (3) Psychology of Handicapped Children – Physical, mental, social, and emotional characteristics of handicapped children (backward, crippled, hard-of-hearing, etc.). Prerequisite: EPSE 312.
- 534 (3) Academic Assessment in School Psychology Prerequisite: EPSE 528 and consent of instructor.
- 535 (3) Social and Emotional Assessment in School Psychology Prerequisites: EPSE 528 and consent of instructor.
- 536 (3/6) d Individual Intelligence Tests Prerequisite: EPSE 528 and admission to the School Psychology Graduate Program.
- 537 (3) Seminar in the Education of Children with Multiple Disabilities – Research and current practice in the education of children with multiple disabilities. Prerequisites: EPSE 448, 513 (may be concurrent).
- 538 (3) Seminar in Orientation and Mobility for the Blind
- 539 (3) Seminar in the Education of the Visually Impaired – Review of educational and developmental research studies of visually handicapped children. Prerequisite: EPSE 314.
- 540 (3) Seminar in Low Vision
- 546 (3) International Trends in Special Education
- 561 (3-12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – .
- 568 (3) Special Education of Children with Neuropsychological Dysfunctions – Current theories of neuropsychological functioning and clinical and classroom intervention techniques for atypical children; focus on mental retardation, language dysfunction, learning disabilities, hyperactivity and autism. Prerequisites: EPSE 312 or 317 and 431.
- 571 (3/6) c Seminar in Research in Educational Psychology and Special Education Prerequisite: EPSE 501 or approved senior course.
- 573 (3) Advanced Seminar in Research on Exceptional Children
- 580 (3-12) d Investigation and Report of a Problem in Education – .
- 581 (3/6) d Special Topics in Research Design and Analysis – Topics vary depending on students needs, and the special interests and competencies of faculty. Includes laboratory and other practical experience. Prerequisites: EPSE 481 and 482.
- 584 (3) Motivation in Education – Cognitively based theories of motivation and metacognition as well as attribution theories. Affective factors in learning and development. Prerequisites: EPSE 313, 501 and 505 (3).
- 585 (3) Social-emotional Learning and Development in Education – Theoretical foundations of the study of learning and development in groups. Competitive and cooperative learning; group interaction; peer modelling. Applications to the classroom as a social system. Prerequisite: EPSE 584.

- 590 (3) Graduating Paper.
- 592 (3) Analysis of Variance in Educational Research Prerequisite: EPSE 482.
- 596 (3) Multiple Regression in Educational Research Prerequisite: EPSE 592.
- 597 (3) Factor Analysis and its Application to Behavioural Sciences Prerequisite: EPSE 596.
- 598 (3-12) c Field Experiences – For those on Masters, Doctoral and Diploma Programs.
- 599 (6/12) c Masters Thesis
- 601 (6) Doctoral Seminar
- 604 (3/6) d Special Topics in Learning, Development and Instruction – Selected topics including: domains of learning (eg., problem solving, thinking, computer assisted learning/instruction, etc.); individual differences; advanced developmental and instructional models. Prerequisites: EPSE 502, 503 and 505 (3) or equivalent.
- 630 (3) Advanced Human Learning and Instruction Prerequisites: EPSE 502 and 503. EPSE 682 recommended.
- 682 (3) Multivariate Analysis in Behavioural Research – Multivariate analysis of variance and covariance, discriminant analysis and canonical analysis. Prerequisite: EPSE 592 and familiarity with matrix algebra.
- 699 Doctoral Thesis
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- Electrical Engineering** **ELEC**
FACULTY OF APPLIED SCIENCE
- *Not open to students in Electrical Engineering.
- 251 (3) Circuit Analysis I – The fundamentals of analysis of lumped linear time-invariant circuits; network theorems; first and second-order circuits; transfer functions. Corequisite: MATH 255. [2-0-2]
- 253 (3) Circuit Analysis II – Phasor analysis; resonance phenomena; poles and zeros; transfer function representation; two-port parameters; applications of Fourier series and Laplace transforms to circuit analysis. Prerequisite: ELEC 251. [2-0-2]
- 254 (3) Electronic Circuits I – Semiconductor fundamentals; modelling of electronic devices including diodes and transistors; design and analysis of non-linear electronic circuits including power supplies, wave shaping circuits, waveform generators and logic circuits. Prerequisite: ELEC 251. [3-0-1]
- 256 (3) Digital Logic Design – An introduction to Boolean Algebra and logical circuits. Realization of simple sequential machines and their use in digital systems. Elementary computer architecture. [2-0-2]
- 259 (3) Introduction to Microcomputers – Organization and operation of microcomputers, memory addressing modes, representation of information, instruction sets, machine and assembly language programming, systems programs, I/O structures, I/O interfacing and I/O programming, introduction to digital system design using microcomputers. Prerequisite: ELEC 256. Credit given for only one of CPSC 213 and ELEC 259. [2-0-2]
- 261 (3) Engineering Electromagnetics – Electrostatics, electric currents, dielectrics, capacitance, electrostatic potential, magnetostatics. [3-0-1]
- 263* (3) Basic Circuit Analysis – Ideal passive elements and sources; Kirchhoff's Laws; D.C. circuits; natural, forced and complete response of RLC circuits; impedance; phasors; complex power, resonance. *Not open to students in Electrical Engineering. Prerequisite: MATH 255. [2-2*-1]
- 280 (2) Electrical Laboratory I – Introduction to oscilloscopes, signal generators and electrical measuring instruments. Experiments in analog and digital logic circuits. [0-3-0]
- 281 (2) Electrical Laboratory II – Experiments involving electronic devices and circuits, electromagnetics and microcomputers. Prerequisite: ELEC 280. [0-3-0]
- 283 (2) Electro-Mechanical Laboratory I – Experiments in analog and digital electronics, including microcomputers, for Mechanical Engineering students in the Electro-Mechanical Design option. [1-2-0]
- 314 (3) System Software Engineering – Introduction to C and UNIX, information structures and processing for systems software, real-time and systems software design, application examples selected from industrial systems. Prerequisites: ELEC 259 and CPSC 128. ELEC 314 may not replace CPSC 216 as a prerequisite for Computer Science courses. Students who intend to register for additional computer science courses must take CPSC 216. [3-0-1]
- 315 (3) Introduction to Operating Systems – Introduction to batch, multiprogramming and time-sharing systems. Processing synchronization and communication. Main memory allocation techniques including virtual memory. Process scheduling, Deadlock avoidance and prevention. File organization and device management. Prerequisites: CPSC 216 and one of CPSC 218, or ELEC 259. Credit given for only one of ELEC 315 and CPSC 315. [3-0-1]
- 320 (3) Design of Discrete Structures – Computer and digital logic applications of combinatorics, graphs, trees, sets and propositions; introduction to formal languages; analysis; design and hardware implementation algorithms. Prerequisites: ELEC 256 and CPSC 128. Corequisite: ELEC 259. [2-0-2]
- 351 (3) Physical Microelectronics – Semiconductor fundamentals, physics of pn junction diodes, bipolar junction transistor and MOSFET transistor operation and analysis, introduction to VLSI. Prerequisites: ELEC 254 and 261. [2-0-2]
- 356 (3) Electronic Circuits II – Study of analysis and design of electronic circuits. Single and multistage amplifiers; tuned amplifiers; feedback amplifiers and oscillators; operational amplifiers. Limitations of circuit components on circuit performance. Prerequisites: ELEC 253, ELEC 254. [2-0-2]
- 359 (3) Signals and Communications – Fourier transform; signal modulation: sampling and multiplexing; analogue and pulse modulation and detection in the presence of noise; discrete time systems response and filtering. Prerequisite: ELEC 253. [3-0-1]
- 360 (3) Systems and Control – Modelling and linear system response; stability; simple feedback control systems; state variables; discrete time control systems; nonlinear systems. Prerequisite: ELEC 253. [3-0-1]
- 364 (4) Electromagnetic Fields and Waves – Maxwell's equations; field calculations; plane waves; TEM transmission lines; guided waves; cavity resonators; radiation and propagation. Prerequisite: ELEC 261. [3-0-2]
- 365* (3) Applied Electronics and Electromechanics – Characteristics of semiconductor devices; analog circuits; force and torque production; motor principles and torque-speed characteristics; principles of power electronics. Prerequisites: ELEC 263 or ELEC 251. [2-2*-2*]
- 366* (4) Electronics Theory and Applications – Modelling of solid state devices; analysis and design of pulse and digital circuits, linear amplifiers, and operational amplifiers including A/D and D/A converters; electronic systems; introduction to micro-computers. [3-2*-2*]
- 367 (3) Electrical Measurements and Electronic Instrumentation – Measurement of voltage, current, impedance, power, and frequency. Theory of measurements. Analysis of waveforms. Characteristics and application of electronic instruments. Analysis of measurement systems. Fault tracing. Prerequisites: ELEC 253, 254, 256. [2-3*-0]
- 370* (3) Electrical Machines and Power Transmission – A study of the basic types of electric motors and generators, transformers, rectifiers and inverters; electrical power measurements; distribution of electrical energy. Prerequisite: ELEC 263 or ELEC 251. [2-2*-1*]
- 371 (3) Power Circuits and Devices – Magnetic circuits. Design and analysis of transformers and actuators. Per unit system. Three phase circuits. Introduction to solid state power converters. Prerequisite: ELEC 253 and one of ELEC 261 or PHYS 251. [2-0-2]
- 372 (3) Rotating Machines – Design and analysis of d.c. induction and synchronous machines. Use of stepper motors. Introduction to machine controls. Prerequisite: ELEC 371. [2-0-2]
- 380 (4) Electrical Laboratory III – Experiments involving physical electronics, electronic and power devices and circuits, signals and communications. Prerequisite: ELEC 281. [0-6-0]
- 381 (4) Electrical Laboratory IV – Experiments involving electromagnetics, rotating machines and control systems. Prerequisite: ELEC 380. [0-6-0]
- 382 (4) Electrical Laboratory IIIA – Experiments involving physical electronics, electronic devices and circuits, signals and communications, and microcomputers. (For Computer Engineering Option students only.) Prerequisite: ELEC 281. [0-6-0]
- 383 (2) Electro-Mechanical Laboratory II – Experiments in electronics and computer system operation and design for Mechanical Engineering students in the Electro-Mechanical Design option. [1-2-0]
- 389 (3) Software Engineering Project – Project involving application of the knowledge and tools covered in CPSC 310 to an engineering application. Prerequisite: CPSC 310. Credit will be given for only one of ELEC 389 or CPSC 319. [1-0-4]
- 450 (3) Economic Analysis of Engineering Projects – Time-money relationships; economic analysis of alternatives including the effects of interest rates, inflation, depreciation, taxation and uncertainty; cost estimation and budgeting; financial analysis of engineering operations. [3-0-0]
- 451 (3) Engineering Product Development and Management. – Product development cycle: generation of ideas and market requirements for new products, economic and quality considerations, the team approach, relationships with suppliers and evaluation of proposed products. Cases involving North American and Japanese firms. [3-0-0]
- 452 (3) Electrical Engineering Materials – Elementary aspects of structure and properties of materials relevant to device applications. Dielectrics, ferroelectrics, ferrites, metals. Prerequisites: ELEC 351 and one of ELEC 261 or PHYS 251. [2-2*-2*]
- 455 (6) Communication Systems – Formulation of the communication problem, signal characterization, transformation of signals by systems; detection and estimation of signals in noise, performance calculations and optimization of amplitude, angle, and pulse modulation systems. signal multiplexing Prerequisites: ELEC 359, STAT 251. [2-0-2]
- 456 (3) Computer Communications – Analysis, design and implementation of computer networks and their protocols. Queueing analysis, data link control, network design, routing, flow and congestion control. Satellite and packet radio networks. Local area networks. Prerequisites: MATH/STAT 205 or STAT 251, one of ELEC 259, ELEC 315 or CPSC 315. Credit will be given for only one of CPSC 417 and ELEC 456. [3-0-1]
- 457 (3) RF Electronics – Introduction to radio communication systems; frequency selective networks; small- and large-signal high frequency amplifiers; oscillators; phase locked loops; modulators and demodulators; AM, FM, SSB and digital transceivers. Prerequisite: ELEC 356 and ELEC 359. [2-0-2]
- 460 (3) Control Systems – Relationships between system parameters and system responses for linear control systems. Design specifications for dynamic and steady-state performance and realization by use of feedback and compensation networks. Design of PI, PD and PID analog and digital controllers. Prerequisite: ELEC 360. [2-0-2]
- 461 (3) Non-Linear and Optimum Systems – Phase plane analysis of on-off motor and temperature controllers.

- Controller non-linearities and limit cycles. Controller linearization by pulse-rate and pulse-width modulation. The minimum principle and its use in the optimum control of systems. Applications to time-optimal and fuel-optimal systems. Prerequisite: ELEC 360. [2-0-2]
- 465 (6) Power Systems Analysis – Power plants, synchronous generators, overhead lines, underground cables, transformers. Automatic generation control, control of voltage and reactive power. Power-flow and short-circuit solutions. High voltage direct current transmission. Prerequisite: ELEC 372. [2-0-2]
- 464 (3) Microprocessor Systems Design – System design strategy, role and application of high level languages, I/O interfacing methods – programmed, interrupt-driven, direct memory access, parallel/serial; real-time interrupt-driven programming; design of microprogrammed computers and special-purpose controllers; microcomputer memory system design; data acquisition and computer controlled systems. Prerequisites: ELEC 259, or the combination of ELEC 256 and CPSC 218. [2-0-2]
- 466 (3) Digital Signal Processing Systems – This course covers the design of digital signal processing systems and implementation in current LSI components such as microprocessors. Digital filter fundamentals and design techniques (impulse invariant, bilinear transform, windowing, FFT methods) are described. Prerequisite: ELEC 359. [2-0-2]
- 468 (3) Digital Process Control – Discrete systems, z-transform; sampled data systems; process control algorithms; multivariable control; state space methods; response to stochastic inputs, Wiener and Kalman filtering; least squares parameter identification. Prerequisite: ELEC 360. [2-0-2]
- 469 (3) Microwave Engineering – Advanced theory of transmission lines and waveguides, microwave passive devices and circuit theory. Prerequisites: ELEC 364 or PHYS 351 for Engineering Physics students. [3-0-0]
- 470 (3) Microwave Circuits – Transmission lines; microwave integrated circuit lines; passive microstrip devices; microwave solid state control devices and circuits, amplifiers, oscillators and frequency conversion circuits. Prerequisites: ELEC 364 or PHYS 351 for Engineering Physics students. [2-0-2]
- 472 (3) Transducers, and Advanced Instrumentation and Measurement. – Performance and construction of transducers. Principles of analog and digital measuring instruments. Precision measurement of electrical parameters. Measurement standards. Measurement of force, pressure, displacement, flow and other physical and chemical parameters. On-line handling of measurement data. Signals in the presence of noise. Interface standards. Calibration Prerequisites: ELEC 351, 359, 360, 367, ELEC 452 (concurrent). [2-3⁺-1]
- 474 (4) Instrumentation Design Laboratory – Theory and practice of electrical measurements and electronic instrumentation. Prerequisite: ELEC 381 or ELEC 382. [1-4-0]
- 475 (4) Project Laboratory – Project in electrical engineering, involving experimental or simulation work, as selected from a list of topics supplied by faculty members. Prerequisite: ELEC 381 or ELEC 382.
- 476 (3) Introduction to Computer Architecture – Control unit structure and microprogramming, memory organization, input-output techniques, microprocessors. Introduction to supercomputer and beyond-Von Neumann architectures. Prerequisite: one of ELEC 259, ELEC 315, or CPSC 315. Credit will be given for only one of CPSC 318 or ELEC 476. [3-0-1]
- 478 (3) Computer Graphics – Physical and virtual graphics I/O devices. The GKS standard. Interactive graphics. Transformations, modelling, rendering algorithms for 2-D and 3-D graphics. Curves and surfaces. Prerequisite: CPSC 216 or ELEC 314. Credit will not be given for both CPSC 414 and ELEC 478. [3-0-0]
- 479 (3) Integrated Circuit Engineering – Overview of the silicon MOS integrated circuit design methodology, including: CMOS process technology, simulation of MOS devices and ICs, basic building blocks for gate arrays and custom designs. Prerequisites: ELEC 256 and ELEC 351. [2-0-2]
- 480 (3) Semiconductor Devices – Theory of operation and technology of fabrication of silicon and III-V semiconductor devices of current interest; e.g., short-channel Si MOSFETs, GaAs MESFETs and high-mobility transistors, homo- and hetero-junction bipolar transistors, III-V light-emitting diodes and lasers. Prerequisite: ELEC 351 or Physics equivalent. [2-0-2]
- 482 (3) Optical Waveguides and Photonics – Planar dielectric waveguides; single mode optical fibers; integrated optics waveguides and devices; semiconductor lasers; optical detectors; optical communications links. Prerequisites: ELEC 351 and ELEC 364. [2-0-2]
- 483 (3) Antennas and Propagation – Basic antenna concepts; antennas for low, medium and high frequencies; terrestrial and satellite propagation links; environmental effects on electromagnetic radiation. Prerequisites: ELEC 364 or PHYS 351 for Engineering Physics students. [2-0-2]
- 485⁺ (3) Digital Instrumentation for Mechanical Systems – Design of microcomputer-based controllers and instrumentation; basics of digital and analog computer interface hardware; processor structure and function; high-level and low-level languages and system design-related issues. Laboratory experiments in basic logic elements, computer interface control, and sensor-based software control of various devices. Prerequisites: CPSC 152, ELEC 365. Credit will be given for only one of ELEC 485 or APSC 380. [2-3⁺-2⁺]
- 486 (3) Optimization Methods for Systems Design – Numerical methods for the optimization of nonlinear objective functions of one and several variables, with and without constraints. Introduction to linear programming. Applications to system design in Electrical Engineering. [2-0-2]
- 487 (3) Introduction to Robotics – Common manipulator configurations, actuator and sensor technology. Efficient representations and computational methods for real-time microprocessor-based implementation of robot control algorithms. Advanced robot control methods, network equivalents and applications to impedance control and bilateral (force-reflecting) teleoperation. Implementation aspects. Prerequisites: PHYS 170 and ELEC 360. [2-0-2]
- 490 (3) Topics in Electrical Engineering I – Lectures on subjects of current interest by Visiting Lecturers. [2-0-2]
- 491 (3) Topics in Electrical Engineering II – Lectures on subjects of current interest by Visiting Lecturers. [2-0-2]
- 493 (4) Power Electronics – AC-DC, DC-DC, DC-AC, AC-AC Converters. Analysis of idealized circuits with generalized loads. Introduction to applications of practical devices – diodes, thyristors, power transistors and FETs. Prerequisite: ELEC 253 or ELEC 263. [2-3⁺-2⁺]
- 494 (3) Real-Time Digital System Design – Multi-tasking, interrupt-driven systems; task scheduling; task inter-communication and synchronization; memory management for real-time systems; performance measurement; hardware/software integration; hardware/software tradeoffs. Prerequisite: ELEC 315 and ELEC 464. [2-0-2]
- 495 (4) Industrial Drives – Analysis of typical loads. Characteristics and analysis of dc and ac drives. Commercial choices of drive for various applications. Dynamic response of ac and dc drives. Microprocessor-based controllers. Prerequisites: ELEC 372 or ELEC 370. [2-3⁺-2⁺]
- 498 (2) Engineering Reports – Copies of specifications are issued by the Department and are available from the Department Office. Prerequisites: ENGL 301 or APSC 201, and 4th Year standing.
- 549 (0) Major Essay – For students in M.Eng. Program.
- 550 (2) Topics in Power Electronic Design – New devices and applications in power electronics. Prerequisite: ELEC 493.
- 551 (3) 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
- 552 (2) Wave Propagation in Multiconductor Transmission Circuits. – Application to power systems, microwave and communication circuits. Matrix form of telegraph equation; physical interpretation of solution through use of matrix calculus. Characteristic impedance, admittance, and propagation coefficient in matrix form. Steady-state application. Transient analysis through the use of the Fourier transform.
- 553 (3) Advanced Power Systems Analysis – Computer-oriented analysis of electric power systems with regard to multiphase line constants, steady-state analysis of single and parallel circuits, lightning and switching surges; large-scale solution of power-flow problems; optimal real and reactive power flow.
- 554 (3) Advanced Power System Control and Dynamics – Synchronous machine modelling; excitation and speed governor systems; enhancing power system damping through excitation or governor control; linear optimal stabilization of power systems; load shedding, generator drooping and other emergency measures; asynchronous operation and resynchronization; nonlinear stability; power-frequency control.
- 555 (3) Fault Tolerant Digital Systems – Design and analysis of high-availability and life-critical embedded and commercial systems.
- 556 (2) Optimum Filtering and Control – The minimum principle, calculus of variations, and dynamic programming. The minimization of algebraic and functional quadratic forms. Applications to optimum filtering for state and parameter estimation and to the optimization of dynamic systems.
- 557 (4) 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.
- 558 (3) Switched Mode Power Supply Design – Survey of different configurations. Choice of components. Magnetic component design. Buck converter. Boost converter. Fly-back converter. Cuk converter. Resonant converter. Converter modelling and analysis techniques. Stability. Electromagnetic interference problems and shielding. Includes project work. Prerequisite: ELEC 493 or equivalent.
- 559 (3) High Power Electronic Converters. – Power electronics at the transmission and distribution levels.
- 560 (3) Network Analysis and Simulation – Solution of lumped and distributed networks. Time-domain solutions, discretization and integration rules. Frequency-domain solutions, FFT and windowing techniques. Systems of linear equations, reduction and sparsity techniques. Nonlinear elements. Computer-aided simulation.
- 561 (3) Alternative Energy Sources. – Photovoltaic, wind, small hydro and fuel cell systems for stand alone and grid connected use.
- 562 (2) Network Design – Realization of lumped and distributed networks. Analogue and digital network synthesis. Sensitivity. Approximations in time and frequency domains. Passive and active filter implementations. VLSI designs.
- 563 (3) Wireless Communication Systems – Characterization of fading channels such as land-mobile, mobile-satellite, cellular and indoor; modem design and performance on fading channels, diversity techniques, carrier and bit synchronization; effects of nonlinearities and interference on system performance, and remedies; software and hardware system designs; system architectures (FDMA, TDMA, CDMA); cellular systems - frequency allocation, spectrum efficiency and channel assignment strategies; spread spectrum systems.

- 564 (3) Detection and Estimation of Signals and Patterns – Parameter detection and estimation, characterization of signals and message sources, linear mean square estimation of random signals, detection of deterministic signals and patterns in noise, realization of detection and pattern recognition systems.
- 565 (2) Data Communications – Analysis and design of data networks for electronic information services and computer communications. Queuing analysis of data link response times; circuit, message and packet switching; multiplexing alternatives; modems; effects of data link capacity, link flows and topology on network performance; network operation and management via data link controls, error control, routing and flow control.
- 566 (3) Communication and Information Theory – Definition of information, encoding of discrete and continuous message sources, coding for noisy channels, design of modulators and demodulators, optimization of one-way and feedback communication systems.
- 567 (2) Privacy and Security in Data Communication Networks. – Introduction to cryptography and cryptanalysis, information, theoretic approaches to secrecy, NBS data Encryption Standard, applications of encryption in data communication systems for privacy and authentication, public key cryptosystems, fraud and counter-measures in data communication networks.
- 568 (2) Control Systems – State-space analysis of continuous and discrete multivariable systems. Controllability and observability. Sensitivity considerations. Stability of linear and nonlinear systems.
- 569 (2) Digital System Applications for the Pulp and Paper Industry. – A laboratory course restricted to students taking the M.Eng. program in Pulp and Paper Engineering. Topics covered include: microcomputer interfacing for instrumentation and control; high-level programming languages; data logging and signal conditioning; sequential control; process control.
- 570 (2) Advanced Industrial Process Control – Discrete time models; process control algorithms; control of systems with process delay; minimum variance control; parameter identification; Kalman filtering. For students in Pulp and Paper Engineering and other specializations using process control.
- 571 (1-4) c Electrical Engineering Seminar and Special Problems.
- 572 (2) c Advanced Topics in Control – Studies in areas of current research interest, with written problem assignments.
- 573 (2) Process Control Applications in the Pulp and Paper Industry. – Control of paper machines, digesters and other pulp and paper process units.
- 574 (2) Self-Tuning Control – Adaptive control; system identification; self-tuning control; design and implementation considerations; algorithm convergence and stability; industrial applications.
- 575 (2) Image and Multidimensional Signal Processing – Analysis and characterization of multidimensional signals; linear and non-linear processing of images for enhancement, storage and transmission; data compression techniques; applications to engineering; introduction to medical imaging; special topics.
- 576 (2) Semiconductor Theory for Device Applications – A treatment of the structure and electronic properties of semiconducting materials; energy bands; carrier transport mechanisms, scattering processes, amorphous semiconductors. Defects in crystals and ionic transport processes.
- 577 (3) Solid State Electronic and Photonic Devices – Solid-state devices of current interest (eg. heterostructure transistors and lasers, very high speed silicon bipolars, short-channel MOSFETs) and their application in high-speed circuits.
- 578 (3) Integrated Circuit Design – Computer-aided design, layout and circuit simulation of ICs. Logic simulation. Testability. Architecture of VLSI systems. Process technologies used in IC fabrication and their influence on IC design rules. Students will design ICs which will then be fabricated by a silicon foundry. Includes three-hour weekly laboratory.
- 579 (2) Topics in VLSI Design – A course in VLSI design with emphasis on microprocessor design. Top-down structured design methodology and the use of CAD tools will be illustrated through a class project. Prerequisite: ELEC 476 or equivalent.
- 580 (2) Fabrication Technology of Semiconductor Devices – Theory and operation of high vacuum systems, vacuum deposition techniques, chemical deposition techniques, thermal diffusion, ion implantation, oxidation, metal-semiconductor contacts, integrated circuit technology, thin film, thick film, hybrid microelectronics.
- 581 (2) Optical Solid State Devices – Electro- and acousto-optic deflectors and modulators. Hologram storage materials. Image storage and processing devices. Display devices. Optical properties of materials.
- 582 (2) Optical Fibers and Devices – Ray optical methods; ray matrices, rectangular and circular dielectric waveguides; loss and dispersion, Gaussian beam transmission and radiation; optical resonators, modulators, sensors; grating multiplexers.
- 583 (4) 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.
- 584 (2) Electrical Communications and Power Cables – Cable materials; design of cables; electrical insulation characteristics; partial discharges in cable insulation; cable manufacturing technology; cable testing and installation practices.
- 585 (2) Antennas and Diffraction – Antenna analysis by Kirchhoff diffraction theory with applications; near and far field radiation patterns; rigorous diffraction theory, the geometrical theory of diffraction and its application to antennas.
- 586 (3) High Voltage Engineering I – Generation of high dc, ac and impulse voltages and high impulse currents in research and test laboratories. Measurement techniques for high voltages, currents and electric fields. Transient voltages in distributed electrical networks. Diagnostic testing of high voltage apparatus.
- 587 (3) High Voltage Engineering II – Introduction to gaseous discharges. Electrical insulation of high dc, ac and impulse voltages in gaseous, liquid and solid media. Failure modes in practical insulation systems. Diagnostic techniques in electrical insulation research.
- 588 (2) Biomedical Signals and Systems Analysis – Modelling and analysis of biological control systems and prostheses.
- 589 (2) System Design for Robots and Teleoperators – Requirements and methods for computer control of manipulator systems; computer simulation of mechanical linkages and actuator systems. Computer architectures suitable for manipulator control in robots and teleoperators. Prior taking of MECH 563 is recommended.
- 590 (2) Speech Analysis and Synthesis – Analysis and characterization of speech signals. Microprocessor techniques for analyzing and synthesizing speech waveforms; speech recognition.
- 591 (3) Applied Digital Signal Processing. – Fundamental theory and applications of Digital Signal Processing. Prerequisite: ELEC 466.
- 592 (2) Architecture for Learning Systems – Symbolic methods used in conventional AI: knowledge representation, search strategies, inference mechanisms in expert system shells. Neural-network methods; system identification and pattern recognition issues, basic paradigms and their promises and limitations. Unified approaches using both symbolic and neural-network methods. Implementation issues using microcomputers in specific application domains, e.g. adaptive control and man-machine communication.
- 593 (3) Advanced Computer Graphics – Geometric modelling, curves and surfaces (Bezier, B-splines). Solid modelling, representation schemes, CSG, B-rep. Volumetric modelling, quadtrees and octrees. Prerequisite: ELEC 478 or equivalent.
- 594 (2) Real-time Digital Systems Software – Real-time system modelling, data models; behavioural models; control models; structured methods; timing constraints; implementation constraints; implementation transformations; and process and resource control; synchronization methods; deadlock issues; storage management; application to engineering examples.
- 595 (2) Parallel Processing and Advanced Computer Architecture – Identification of parallelism, optimal and sub-optimal concurrency scheduling, deadlocks, Petri networks and other models of parallelism, data flow machines, systolic arrays, pipeline and array processors, other parallel architectures, interconnection networks, intelligent memory systems.
- 596 (2) Optical Signal Processing – The optical system as a two-dimensional linear system. Diffraction theory. Optical systems for image formation, data processing and interferometry. Holography and some of its engineering applications.
- 597 (6) Project in Pulp and Paper Engineering – Project report on assigned topic of specialization. For students registered in the M.Eng. program in Pulp and Paper Engineering, where project is supervised by a faculty member of the Department of Electrical Engineering.
- 599 (12) Thesis – For M.A.Sc. degree.
- 699 Thesis – For Ph. D. degree.

**English
Faculty of Arts**
ENGL

Attainment of a satisfactory Language Proficiency Index score is prerequisite to registration in 100-level English courses. See Calendar index under Language Proficiency Index (LPI).

- 110 (3) Approaches to Literature – Study of selected examples of poetry, fiction, and drama. Essays are required. [3-0]
- 111 (3) Approaches to Non-fictional Prose – Study of a selection of prose texts ranging in length from the essay to the book, with emphasis on writing of the twentieth century. Essays are required. [3-0]
- 112 (3) Strategies for University Writing – Study and application of the principles of university-level discourse, with emphasis on expository and persuasive writing. Essays and exercises are required. [3-0]
- 120 (3) Literature and Criticism – Enriched study of selected works of literature from a number of critical perspectives. Open to students with a mark of A in English 12 or B+ in English Literature 12. Essays are required. [3-0]
- 121 (3) Introduction to Literary Theory – Study of various theories of literature. Open to students with a mark of A in English 12 or B+ in English Literature 12. Essays are required. [3-0]
- 201 (6) Major Authors to 1914 – A survey of the major English writers, focusing on Chaucer, Shakespeare, and Milton in the first term, and in the second term on at least 6 later writers, including two novelists. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0; 3-0]
- 202 (6) Introduction to Canadian Literature – The major types of Canadian writing: novel, short story, poetry, non-fictional prose, and humour. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0; 3-0]

- 203 (6) Biblical and Classical Backgrounds of English Literature – The main biblical texts and classical myths, and their use in English works. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0; 3-0]
- 204 (3) Short Fiction – The short story and novella in the nineteenth and twentieth centuries, with some material from earlier periods. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0]
- 205 (3) Introduction to Poetry – Principles, methods, and resources for developing an appreciation of poetry. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0]
- 206 (3) Introduction to Drama – Principles, methods, and resources for developing an appreciation of drama. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0]
- 207 (3) Introduction to the Novel – Principles, methods, and resources for developing an appreciation of the novel. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0]
- 208 (6) Introduction to American Literature – The major types of American writing: novel, poetry, drama, short story, and non-fictional prose. Essays are required. Prerequisite: Six credits of first-year English or Arts One. [3-0; 3-0]
- 210 (6) An Introduction to English Honours – For prospective Honours students accepted by the English Honours Committee on the recommendation of the instructor. Students permitted to take this course must take ENGL 211 concurrently. Prerequisite: Six credits of first-year English or Arts One. [3-0; 3-0]
- 211 (6) Seminar for English Honours – An introduction to practical criticism; required of and open only to students of ENGL 210. A limited number of texts from a range of genres and periods will be chosen for close critical analysis. [3-0; 3-0]
- 301 (5) Technical and Business Writing – Study of the principles of written communication in general business and professional activities, and practice in the preparation of abstracts, proposals, reports, and correspondence. This course is closed to first- and second-year students in Arts. Prerequisite: Six credits of first-year English or Arts One. [3-0]
- 302 (5) Advanced Practical Writing – Library research in the student's professional field; the writing of articles and research papers; detailed preparation of term or graduating essays required in a number of departments and faculties. Attention will be given to appropriate style as well as Prerequisite: ENGL 301 or permission of course chair. [0-0; 3-0]
- 303 (6) Intermediate Composition – Study of the principles and extensive practice in the writing of effective prose, from arrangement and punctuation to various stylistic strategies. May be taken in the second year. Prerequisite: Six credits of first-year English or Arts One. [3-0; 3-0]
- 304 (6) Advanced Composition – Special emphasis on rhetoric, with a focus on audience, authorial voice, and range of style. [3-0; 3-0]
- 306 (6) History and Theory of Rhetoric – Major theories of rhetoric studied chronologically with particular emphasis on the relationship between traditional and modern theories. [3-0; 3-0]
- 307 (3-12) d Studies in Rhetoric – Topics in rhetorical theories and their application. [3-0] or [3-0; 3-0]
- 308 (3) The Theory and Application of Rhetorical Criticism – A study of literary texts from a rhetorical perspective, a critical point of view that defines the literary work as a structured instrument for the communication of a specific message. [3-0]
- 310 (6) 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 (6) 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 life. [3-0; 3-0]
- 312 (5-12) d Studies in Poetry – Critical studies of representative English poems grouped according to form and content. [3-0] or [3-0; 3-0]
- 313 (5-12) d Studies in Drama – One-term or full-year course on particular periods, topics, or dramatic genres, focusing on close reading of appropriate texts. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 314 (3-12) d Studies in Fiction – Special topics involving thematic, generic, or formal approaches to fiction. [3-0] or [3-0; 3-0]
- 315 (5-12) d Studies in Non-Fictional Prose – Special topics such as types of non-fictional prose, the prose of individual periods, or developments in prose style. [3-0] or [3-0; 3-0]
- 316 (5-12) d Studies in Literature and the Other Arts – Ways in which writers and artists in other media deal with common themes; problems in formal and stylistic relationships between literature and other arts. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 317 (3-12) d Studies in Comparative Aspects of English Literature – Relationships between different national literatures in English; perhaps also thematic and formal influences of other literatures upon literature in English. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 318 (5) Children's Literature – A study of selected works from children's literature of the last three centuries; connections between children's literature and the adult cultural tradition. [3-0]

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- 319 (3-12) d Studies in the Intellectual Backgrounds of Literature – Special topics in the history of ideas, with particular reference to ideas that illuminate or are embodied in literature. [3-0] or [3-0; 3-0]
- 320 (6) History of the English Language – Development of the English language from West Germanic to the present; phonology, morphology, syntax, and vocabulary. [3-0; 3-0]
- 321 (3) English Traditional Grammar – Traditional grammar from its origins to its codification in modern English grammars. [3-0]
- 322 (3) Stylistic Variation – The application of linguistic theory and method to the stylistic analysis of English literary texts. Prerequisite: ENGL 329. [3-0; 0-0]
- 323 (3) Dialectal Variation – Geographical and social variation in English, and the representation thereof in literary texts. Prerequisite: ENGL 329. [0-0; 3-0]
- 324 (3) Literary Semantics – The relation and application of semantic principles to literary theory and interpretation. An introductory course in linguistics or English language is recommended. [3-0]
- 325 (3) History of the English Language – For Honours students. [3-0]
- 326 (3-12) d Studies in the English Language – Intensive study of some topic or aspect of English language. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 329 (6) The Structure of Modern English – A description of English phonetics, phonology, grammar, and vocabulary. Open to second-year students. [3-0; 3-0]
- 330 (3/6) d Practical Criticism – Exercises in criticism involving various critical approaches to literature. A limited number of texts will be examined closely. [3-0] or [3-0; 3-0]
- 331 (6) History of Criticism – Exploration of seminal statements about the purpose, scope, and methods of literary criticism, and the nature and inter-relationships of literary theme, form, and genre. [3-0; 3-0]
- 332 (6) Modern Critical Theories – A review of modern trends, with some emphasis on practical criticism. [3-0; 3-0]
- 333 (3) Canadian Criticism and Theory – Developments in Canadian criticism and literary theory. [3-0]
- 335 (3-12) d Studies in Major Authors – The works of no more than two significant writers will be examined. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 336 (3-12) d Studies in Criticism and Bibliography – Topics in these fields, including criticism in individual periods, individual critics, and bookmaking and documentation. [3-0] or [3-0; 3-0]
- 337 (3/6) d The Literature of Fantasy – A study of fantasy in fiction, drama, and poetry, which may include topics such as science fiction, the gothic novel, and utopian literature. [3-0] or [3-0; 3-0]
- 340 (3) Introduction to Old English – Old English grammar, with readings in the prose of the period. [3-0; 0-0]
- 341 (3) Old English Poetry – A survey with emphasis on Beowulf. Prerequisite: ENGL 340. [0-0; 3-0]
- 345 (3) Old English – For Honours students. [3-0]
- 350 (6) A Survey of Middle-English Literature Excluding Chaucer [3-0; 3-0]
- 351 (3-12) d Studies in Middle-English Literature – Special studies of individual themes, genres, and authors. [3-0] or [3-0; 3-0]
- 352 (3) Middle English – The forms and development of the language. [3-0]
- 353 (3) Early English Drama – The development of English drama in the Middle Ages. [3-0]
- 355 (6) Chaucer – A detailed study of Chaucer's major works. [3-0; 3-0]
- 356 (3) Chaucer – For Honours students. [3-0]
- 360 (6) Sixteenth-Century Literature to 1611 – The English Renaissance: its literature and some of its formative ideas. [3-0; 3-0]
- 361 (3) Spenser – The work of Edmund Spenser with emphasis on *The Faerie Queene*. [3-0]
- 363 (6) Tudor and Stuart Drama – English drama from the reign of Henry VIII to the closing of the theatres in 1642; emphasis on Elizabethan and Jacobean playwrights. [3-0; 3-0]
- 365 (6) Shakespeare – Lectures on various aspects of Shakespeare's art. Detailed study of eight plays. [3-0; 3-0]
- 366 (3-12) d Studies in Shakespeare – Examination of particular aspects of Shakespeare's writing. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 367 (3) Shakespeare – Intensive study of at least six plays. For Honours students. [3-0]
- 370 (6) 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]
- 371 (3) Poetry of the Earlier Seventeenth Century – Examination of one or more of the major trends in poetry before 1660: Donne and the metaphysical style; Jonson and the classical style; the Cavalier poets. [3-0]
- 372 (3) Seventeenth-Century Prose – The work of one or more of the prose writers from Bacon to Tillotson will be studied in relation to the period and the development of prose style. [3-0]
- 375 (6) Milton – The work of Milton with special emphasis on *Paradise Lost*. [3-0; 3-0]
- 376 (3) Milton – For Honours students. [3-0]
- 380 (6) 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]
- 381 (3) Poetry of the Age of Dryden and Pope – [3-0]
- 382 (3) Poetry of the Middle and Late Eighteenth Century – Developments in poetry from the death of Pope to the end of the century. [3-0]
- 383 (3) Restoration and Eighteenth-Century Drama – [3-0]
- 384 (3) The English Novel in the Eighteenth Century – The beginnings of the realistic novel and its development from Defoe to Jane Austen. [3-0]
- 389 (3-12) d Studies in Eighteenth-Century Thought and Literature – Term or full-year course in which systems of thought or other elements of the culture of the period will be studied as they contribute to the interpretation and evaluation of literature. Topics will vary from year to year. [3-0] or [3-0; 3-0]
- 390 (6) 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 (6) Romantic Poetry – Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats. [3-0; 3-0]
- 392 (6) Victorian Poetry – Intensive study of major and minor Victorian poets. [3-0; 3-0]
- 394 (3) The Victorian Novel – Developments in the novel from Dickens to Thomas Hardy. [3-0]
- 400 (6) Early Modern British Literature – 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]
- 401 (3) Modern British Poetry – A study of major poets and poetic movements from 1910 to the Second World War. [3-0]
- 403 (3) Modern British Drama – A study of major movements and dramatists from the late nineteenth century to the Second World War. [3-0]
- 404 (3) The Modern British Novel – Developments in the novel up to the Second World War. [3-0]
- 410 (6) Twentieth-Century British Literature – Major figures and trends in British literature since 1914: Eliot, Yeats, Joyce, Lawrence, Forster, Waugh, Orwell, Auden, Thomas, and others. [3-0; 3-0]
- 411 (3) Contemporary British Poetry – A study of major poets and poetic movements from the Second World War to the present. [3-0]
- 413 (3) Contemporary British Drama – A study of movements and major dramatists since the Second World War. [3-0]
- 414 (3) The Contemporary British Novel – The novel from the Second World War to the present. [3-0]
- 416 (3/6) d Twentieth-Century Irish Literature – Irish literature in English since the Irish Literary Renaissance. [3-0] or [3-0; 3-0]
- 420 (3) Canadian Literary Genres – An overview of the range and variety of writing in Canada. [3-0]
- 421 (3) Canadian Poetry – Formal and historical developments in English Canadian poetry. [3-0]
- 422 (3) The Long Poem in Canada – Forms of the long poem in English. [3-0]
- 423 (3/6) d Canadian Drama – Canadian drama in English with some attention to French-Canadian drama in translation. [3-0] or [3-0; 3-0]
- 424 (3) Canadian Novel – Formal and historical developments in the Canadian novel. [3-0]
- 425 (3) Canadian Short Fiction – Formal and historical developments in Canadian short fiction. [3-0]
- 426 (3-12) d Studies in Canadian Literature – Special topics which may include particular periods, individual authors, or material not covered in other courses. Specific topics will be announced each year. [3-0] or [3-0; 3-0]
- 427 (3-12) d Studies in First Nations Writing – Special studies of individual authors or of themes. [3-0] or [3-0; 3-0]
- 429 (3/6) d Backgrounds of Canadian Literature – A study of selected literary texts in relation to the work of essayists, letter-writers, etc., whose writings have contributed to the creation of Canadian literature. [3-0] or [3-0; 3-0]
- 430 (3) A Survey of American Literature to 1900. – Representative writers and themes from the colonial period to 1900. [3-0]
- 431 (3) American Poetry to 1900 – [3-0]
- 433 (3) American Drama – Drama in the United States, with emphasis on the major playwrights of the twentieth century. [3-0]
- 434 (3) American Fiction to 1900 – Emphasis on the writings of Irving, Poe, Hawthorne, and Melville. [3-0]
- 435 (3) American Fiction in the First Half of the Twentieth Century – Major movements and writers. [3-0]
- 436 (3-12) d Studies in American Literature – Special studies of individual periods or authors or themes. [3-0] or [3-0; 3-0]
- 437 (3) American Fiction from Mid-Twentieth Century to the Present – [3-0]
- 438 (3-12) d Comparative Studies in Canadian and American Literature – The study of two national literatures in relation to each other. [3-0] or [3-0; 3-0]
- 439 (3) Survey of American Literature from 1900 to the Present. – Students who have taken English 430 before 1995 cannot enrol in this course. (3-0)
- 440 (6) Literature of the Commonwealth – A comparative study of the traditions of English literature outside England, particularly of the growth of indigenous literatures (in English) in the countries of the Commonwealth. [3-0; 3-0]
- 446 (3-12) d Studies in Literatures of the Commonwealth – Special topics, varying from year to year, including studies of individual authors, genres, and nations. [3-0] or [3-0; 3-0]
- 450 (6) A Critical History of English Literature – A survey of movements and writers from Chaucer to the early twentieth century.

- eth century. This course is not open to students who have taken ENGL 201, 210 or equivalent. [3-0; 3-0]
- 451 (3-12) d Studies in Literary Movements – Such literary movements as Naturalism, Realism, Intuitionism, Impressionism, Vorticism, and Modernism. [3-0] or [3-0; 3-0]
- 460 (3) American Poetry of the First Half of the Twentieth [3-0]
- 461 (3) American Poetry from the Mid-Twentieth Century to the Present [3-0]
- 480 (3) Studies in Medieval English Literature [3-0]
- 481 (3) Studies in Renaissance English Literature [3-0]
- 482 (3) Studies in the Eighteenth Century [3-0]
- 485 (3) Studies in the Nineteenth Century [3-0]
- 484 (3) Studies in British Literature of the Twentieth Century [3-0]
- 485 (3) Studies in American and Canadian Literature of the Twentieth Century [3-0]
- 486 (3) Studies in Criticism [3-0]
- 487 (3) Studies in Drama [3-0]
- 488 (3) Studies in Poetry [3-0]
- 489 (3) Studies in the Novel [3-0]
- 490 (3) Introduction to Methods of Literary Research Prerequisite: ENGL 211. [3-0]
- 491 (6) Third Year Honours Tutorial [3-0; 3-0]
- 492 (6) Fourth Year Honours Seminar [3-0; 3-0]
- 496 (6) Readings in English Literature
- 497 (6) Readings in English Literature
- 499 (6) Honours Essay
- 500 (3) Research Tools and Methods – Required of all graduate students in thesis programs.
- 501 (3-12) d Studies in Bibliography
- 502 (3-12) d Studies in Criticism
- 503 (3-12) d Studies in Prose
- 504 (3-12) d Studies in Drama
- 505 (3-12) d Studies in Fiction
- 506 (3-12) d Studies in Poetry
- 507 (3-12) d Studies in the History of the English Language
- 508 (3-12) d Studies in the Structure of the English Language
- 509 (3-12) d Studies in Rhetoric and Theory of Composition
- 510 (3-12) d Studies in Old English
- 511 (3-12) d Chaucer
- 512 (3-12) d Middle English Studies
- 514 (3-12) d Studies in the Renaissance
- 515 (3-12) d Shakespeare
- 519 (3-12) d Studies in the Sixteenth Century
- 520 (3-12) d Studies in the Seventeenth Century
- 525 (3-12) d Studies in the Eighteenth Century
- 530 (3-12) d Studies in the Romantic Period
- 535 (3-12) d Studies in the Victorian Period
- 539 (3-12) d Studies in the Twentieth Century
- 540 (3-12) d Studies in American Literature to 1890
- 541 (3-12) d Studies in American Literature Since 1890
- 545 (3-12) d Studies in Canadian Literature
- 546 (3-12) d Studies in Commonwealth Literature
- 547 (3/6) c Directed Reading
- 548 (0) Major Essay
- 549 (6-12) c Master's Thesis
- 551 (3-12) d Studies in Literary Movements
- 552 (3/6) d Practical Criticism – Close reading and analysis of selected literary texts.
- 553 (3-12) d Studies in Literary Theory
- 555 (3-12) d Studies in Literature and the Other Arts
- 649 Ph.D. Thesis
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- English Education** **ENED**
SEE LANGUAGE EDUCATION, FACULTY OF EDUCATION
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- Environmental Studies** **ENVR**
FACULTIES OF ARTS AND SCIENCE
- 200 (3) Environmental Studies I – An introduction, in seminars and field trips, to the major global and local (Southwestern B.C.) environmental issues facing human societies. Enrolment restricted to, and required of, students registered in the Second Year of the B.A. Honours program in Environmental Studies and the B.Sc. Honours program in Environmental Sciences. [0-0-0; 0-6⁺-2]
- 300 (3) Environmental Studies II – Critical reviews of a number of environmental impact studies or assessments will be undertaken. Small interdisciplinary teams of students will choose a topic of environmental concern and present a proposal for its investigation. Required of students registered in the Third Year of the B.A. Honours program in Environmental Studies and the B.Sc. Honours program in Environmental Sciences. Prerequisite: ENVR 200. [0-0-0; 0-0-3]
- 400 (6) Environmental Studies III – Students collaborate in interdisciplinary teams to execute environmental studies defined in ENVR 300. A substantial report is required. Required of students registered in the fourth year of the B.A. Honours program in Environmental Studies and the B.Sc. Honours program in Environmental Sciences. Prerequisite: ENVR 300. [0-4-0; 0-4-0]
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- Family Practice** **FMPR**
FACULTY OF MEDICINE
- 401 (4) Introduction to Family Practice – Correlation of basic medical and behavioural sciences to the Family Practice setting. Principles and skills of patient interviewing, history taking, physical examination are practised under supervision in office, home, hospital and community settings. Role of Family Physician in comprehensive patient care.
- 426 Rural Family Practice Experience – As apprentices of family physicians in rural communities students will participate in the professional and social/societal activities of doctors and their associates. Enrolment may be limited to posts available.
- 451 (3) Seminars in Family Medicine – An examination of the content of Family Medicine including practical sessions on selected clinical problems encountered in the office, home or institutions. Third year elective.
- 480 (3) Occurrence, Diagnosis and Management of Athletic Disabilities. Musculoskeletal and Sense Organs. – Mechanisms underlying injuries to bones, joints, muscles and tendons during sport and recreational physical activity; infections and injuries involving skin, eyes, ears, nose and throat. Prerequisites: ANAT 390 or ANAT 400 or equivalent, plus PHYL 301 or BIOL 353 or equivalent or admission to course at discretion of the Department of Family Practice. [4-0]
- 481 (3) Occurrence, Diagnosis and Management of Athletic Disabilities II. Internal Organs. – Disorders of function of respiratory, cardiomyocardial, hematological, gastrointestinal, genitourinary, endocrine and central nervous systems arising from sports and recreational physical activity. Effects of environment, heat, cold, pressure, altitude and diving) and nutritional factors on athletic performance; mechanisms of adaptation to these external influences. Prerequisites: ANAT 390 or ANAT 400 or equivalent, plus PHYL 301 or BIOL 353 or equivalent, or admission at the discretion of the Department of Family Practice. [4-0]
- 562 (3) Health Promotion and Disease Prevention in Family Practice – Identification of preventive strategies in different age groups and their implementation in Family Practice. Examination of health belief models in caregivers and patients which inhibit or facilitate preventive measures. Admission to course at discretion of the Department of Family Practice. Prerequisite: HCEP 502.
- 700 Bedside Conferences – The bedside review of case histories and physical findings in cases with primary responsibility and those referred for specialist care. Discussion of pathophysiology and treatment at all levels of care throughout the normal lifespan is emphasized.
- 701 Resident Seminars – The preparation and presentation of formal papers on specialized topics in Family Practice, by each member of the resident staff. The paper is criticized by a member of the clinical teaching team. One hour weekly.
- 702 Office Practice – Technical procedures and patient care – three to twenty hours per week under supervision and instruction related to ambulatory, primary, patient care office diagnostic procedures and ongoing management.
- 703 Family Practice Rounds – Lectures, seminars and reviews of clinical problems related to family practice. One hour weekly.
- 704 Seminars on Patient Counselling – Personal and group interaction. One hour weekly.
- 705 Medical Economics – A series of seminars, demonstrations and discussions on aspects of medical economics, office practice and personal security given by a number of experts in the various fields.
- 706 Community Practice – An opportunity is offered for residents to experience the role and function of community helping agencies; as often as possible by following their own patient through the function of each specialized service.
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- Family Science** **FMSC**
SCHOOL OF FAMILY AND NUTRITIONAL SCIENCES,
FACULTY OF AGRICULTURAL SCIENCES
- 200 (3) Introduction to Family Science – A developmental approach, focusing on individual development in families, internal dynamics of family life, and the place of the family in North American society. [3-0]
- 310 (3) The Family Context of Human Development – The influence of family structure and dynamics on human development studied from a multi-disciplinary, theoretical perspective. Prerequisite: FMSC 200. [3-0]
- 312 (3) Parent-child Relationships – Parent-child interaction as affected by family structure and social conditions. Impact of social change on parent-child interaction. Prerequisite: FMSC 200 or PSYC 100. [3-0]
- 314 (3) Development of Relationships – The empirically based study of the development, course, and decline of personal relationships over the life span. Emphasis will be on the internal dynamics of dyadic relationship development. Prerequisite: FMSC 200 or PSYC 100 or SOCI 240. [3-0]
- 316 (3) Human Sexuality – An examination of research and theory on selected topics in human sexual development and behaviour throughout the life span. Prerequisite: FMSC 200 or permission of the instructor. [3-0]
- 320 (3) The Contemporary North American Family in Societal – The contemporary North American family and marriage viewed from the developmental perspective. Transactions between the institution of the family and other societal institutions over the life span of the family. Prerequisite: FMSC 200. [3-0]
- 322 (3) Marital and Family Interaction in North America – Interactional processes within the family; special emphasis on marital interaction and its effects on children. Prerequisites: FMSC 200 or SOCI 200. [3-0]

- 324 (3) The Development of Family Careers – The paths Canadians follow through the life span and the relationships between family career, educational career, and occupational career. [3-0]
- 326 (3) Communication in the Family – Historical overview; theoretical and methodological issues in the study of communication in family settings. [3-0]
- 338 (3) Family Resource Management – Conceptual models of management; resource management concepts as related to family careers and to different family types. [3-0]
- 340 (3) Family Financial Management – Major financial alternatives available to families during the various periods of the family career; financial decisions of families and their impact on family and individual well-being; use of current and future income (credit); purchasing of goods and services; providing financial security; organizations and laws which affect family financial decisions. [3-0]
- 342 (3) Family Consumer Patterns – Role and function of consumers in contemporary market economies; consumer socialization; factors affecting consumer choice as it varies at various periods of the life span for different family types. Prerequisite: ECON 100 or 309, or six credits of Psychology or Sociology. [3-0]
- 350 (3) Clothing and Human Behaviour – Human needs and the cultural factors which influence clothing consumption and use. Application of sociological and psychological theories that help to explain clothing behaviour of an individual, as a unique being and as a member of a group. Prerequisite or corequisite: 12 credits in Sociology or Psychology. [3-0]
- 364 (3) Housing For the Family – A study of the physical, social and economic aspects of housing. The course includes: housing as an economic asset; national housing needs and conditions; personal and social needs of families; housing and the family income; government's role in housing; community planning. Prerequisite or corequisite: ANTH/SOCI 100 or permission of the instructor. [3-0]
- 404 (3/6) d Family Sciences Seminar – Current developments in selected areas of Family Sciences. Open to third- and fourth-year students with permission of the instructor. [0-3]
- 414 (3) Aging and the Family – The family during the later stages of its career; topics include changing family dynamics, marital satisfaction, intergenerational relations, widowhood, grandparenthood, and remarriage. Prerequisite: FMSC 200 or PSYC 100 or ANTH/SOCI 214. [3-0]
- 420 (3) Contemporary Theories in Family Analysis – Major theoretical approaches to the study of the family. Each approach is assessed for its strengths and weaknesses on the basis of empirical data. Prerequisite: FMSC 200. [3-0]
- 422 (3) Family Research – Introduction to the types of research methods used in the study of the family, their special problems and applications. Techniques for both conducting and evaluating research. Prerequisites: FMSC 200 and STAT 203. [3-0]
- 436 (3) Family Life Education Over the Life Span – Examination of programs which educate individuals for present and future family roles; rationale, implementation, and evaluation of such programs; issues in training. Prerequisite: FMSC 200 or FMSC 312. [0-3]
- 440 (3) Families in the Canadian Economy – Forces in the Canadian economy which have an impact on families; inflation/recession, taxation, social assistance, and employment policies as these affect family income generation, adequacy, and security. Prerequisite: ECON 100. [3-0]
- 442 (3) Economic Roles of Women – Past and present economic roles of women; factors affecting participation in the labour force; occupational segregation, inequality, and discrimination; job satisfaction; women as volunteers and as consumers; labour force participation related to other roles for women. Prerequisite: six credits from FMSC 200 or WMST 222 or PSYC 100 or 206. [3-0]

- 464 (3/6) d Special Problems in Family Science – Current topics in a specific area of Family Science, based on original laboratory or field research.
- 474 (3) Directed Study in Family Science – Investigation of a problem, requiring a written or oral report of findings. Prerequisite: satisfactory standing and permission of faculty members supervising the investigation. Fourth-year Family Science students only.

**Family Studies FMST
SCHOOL OF FAMILY AND NUTRITIONAL SCIENCES,
FACULTY OF AGRICULTURAL SCIENCES**

- 504 (3-9) d Current Topics in Family Studies
- 520 (3) Theories About the Family – An examination of contemporary theories of the family. [3-0]
- 521 (3) Formulating Theories About the Family – Fundamental issues and techniques in formulating theories about the family. Prerequisite: FMST 520 or permission of instructor. [3-0]
- 522 (3) Research Methods in Family Studies – Designing research and collecting data for studying families. Prerequisite: FMSC 422 or equivalent. [3-0]
- 523 (3) Analyzing Data in Family Studies – Data analysis issues and computer applications in the study of families. Prerequisite: FMSC 422 or equivalent. [3-1]
- 524 (3) Family Development – An examination of research and theory on the timing and sequencing of the course of family life in North American families. [3-0]
- 525 (3) Interaction in the Family Setting – Selected aspects of marital, parental and intergenerational interaction. [3-0]
- 538 (3) Family Resources – Conceptual and empirical perspectives on family resource management. [3-0]
- 547 (3-6) c Directed Studies
- 549 (6/12) c Thesis

**Film Studies FILM
DEPARTMENT OF THEATRE AND FILM, FACULTY
OF ARTS**

- 230 (6) Introduction to Film and Television – An introduction to the development, the techniques, and the social and artistic functions of film and television. Lectures, demonstrations and discussions of the technology, history and criticism of these media and of selected films and television productions. [2-2; 2-2]
- 233 (3) Introductory Film and Video Production – A beginning course designed for students with no previous experience in production. The course will familiarize them with basic equipment and tools, and introduce them to the elementary principles of production. Preference given to those who have taken or are taking FILM 230 and permission of the Instructor. [1-2]
- 330 (6) History of Film – Study of the development of film from its origin to the present, including the pre-history of film, silent film, the introduction of sound, the major movements and film makers of the last ninety years. (Also listed as FINA 393.) [2-2; 2-2]
- 331 (3) Studies in Film Theory – A seminar introducing the many theoretical approaches to film: formalist, historical, Marxist, psychoanalytic, semiotic and structuralist. (Open only to 3rd year Film Majors.)
- 332 (3) Studies in Genre or Period – A seminar examining one or more genres or periods, such as the Western, Film Noir, Science Fiction, Films of the 1980's. Also includes study of national cinemas. Prerequisite: FILM 230 or FILM 330 and permission of the Instructor.
- 333 (6) Intermediate Film Production – Practical film-making course, with instruction in the use of 16mm film and half-inch videotape format. By application with portfolio to the Department. Students are responsible for production costs. [2-3; 2-3]

- 334 (6) Animation – History, theory, technique, and design of animated films. Prerequisite: FILM 230 and permission of the instructor. [2-3; 2-3]
- 430 (3) Studies in Auteurism – A seminar examining the work of one or more directors, such as John Ford, François Truffaut, Denis Arcand, Margarethe von Trotta; or of a screenwriter over many films. Prerequisite: FILM 230 or FILM 330 and permission of the Instructor.
- 432 (3) Studies in Film Forms – A seminar examining one or more of the following film forms: the animated film, the documentary film, and the experimental film. Prerequisite: FILM 230 or FILM 330 and permission of the Instructor.
- 433 (6) Advanced Film Production – Advanced instruction in professional film production techniques. Prerequisite: For Film majors only. Students are responsible for production costs. [5-1; 5-1]
- 434 (3/6/12) d Studies in Film – A seminar devoted to a topic of current interest in film. Topic will change from year to year. May be repeated for credit when topics differ. Prerequisites: FILM 230 or 330 and permission of the instructor. [3-0; 3-0]
- 435 (3) Directing – Script development and analysis, scene and shot design, working with actors, working with crew, preparation of shooting scripts. [0-3]
- 437 (3) Camera, Lighting and Sound Recording – Instruction in 16mm synch sound camera operation, advanced film lighting techniques, location and studio sound recording and re-recording techniques. [0-3]
- 439 (3) Post-production Techniques – Instruction in advanced post production techniques including picture and sound editing, liaison with the lab and other film services, preparations for sound mixing. [0-3]
- 500 (3) Bibliography and Research Methods.
- 531 (3/6) Seminar: Styles in Film – Studies and experimentation in styles or genres in film such as the documentary, the narrative film, the scientific film, the ethnographic film, the experimental film, etc. Topics will vary from year to year.
- 532 (3/6) Seminar: Study of Major Film Artists – Investigations into the biographical, social, and national backgrounds of two or three major artists, with attention to the specific nature of their work in its historical, psychological, and cultural contexts. Topics will vary from year to year.
- 533 (3/6) Advanced Problems in Film Production – Advanced production techniques. The student will be expected to master advanced production techniques in such areas as sound mixing, colour cinematography, special effects, synchronous dialogue editing, scripting, and directing.
- 534 (3/6) Seminar in Film Studies – Topics to be arranged.
- 547 (3/6) Directed Studies in Film.
- 549 (6/12/18) Master's Thesis.

**Fine Arts FINA
FACULTY OF ARTS**

- Admission to Fine Arts 218-290 requires an evaluation of a portfolio of works and normally an interview. This should be arranged with the Department of Fine Arts no later than March 31 of the preceeding academic year. Students must register for 12 credits of the following courses, among which must be FINA 281. Students wishing fewer courses may register only at the end of the registration period and on a "space available" basis. The complementary third-year course is a prerequisite for FINA 431 through 469. Most of these seminars are normally offered in alternate years.
- 100 (6) Introduction to Art History – The forms, concepts, issues, and language of analysis for the understanding of art in context, using examples of painting, sculpture, architecture, and other arts from the history of world art. [2-1; 2-1]

- 125 (6) History of Western Art – The history of architecture, sculpture, and painting of the Western World from Ancient Egypt and Mesopotamia to the present. Offered Extra-Sessionally only. Credit will not be granted for both FINA 125 and FINA 225 and/or 226. [2-1; 2-1]
- 181 (6) Basic Studio Practice – An introductory study of visual forms, conducted through weekly lectures and studio work. The course focuses mainly upon drawing and explores its relationship to other kinds of art practice. Enrolment restricted; priority given to prospective Fine Arts B.A. Major and Honours, B.A. in Studio Arts and B.F.A. students. [1-3; 1-3]
- 225 (3) Art in Europe to the Sixteenth Century – A selective survey of painting, sculpture, and architecture. Credit will not be granted for both FINA 125 and FINA 225 and/or 226. [2-1; 0-0]
- 226 (3) Art in Europe and North America from the Sixteenth Century to the Present – A selective survey of painting, sculpture, and architecture. Credit will not be granted for both FINA 125 and FINA 225 and/or 226. [0-0; 2-1]
- 251 (3) Aspects of Asian Art – A selective introduction to the arts of the civilizations of India, China, and Japan, with stress upon their diverse characteristics. [3-0]
- 261 (3) Native Arts of the Americas – General themes and trends in New World art. [3-0]
- 281 (3) Drawing – Basic skills in drawing, including life drawing. Required course for all students in the B.A. program in Studio Arts, and for all prospective B.F.A. students. Prerequisites: FINA 181 and six credits of art history. Available both terms. [0-3]
- 282 (3) Painting – Some basic painting concerns. Prerequisites: FINA 181 and six credits of art history. [0-3]
- 283 (3) Etching – Intaglio and relief printing, especially metal-plate etching. Emphasis on the development of imagery in relationship to technique. Prerequisites: FINA 181 and six credits of art history. [0-3]
- 284 (3) Silkscreen – The use of hand-cut, photographic, and other silkscreen-printing techniques. Prerequisites: FINA 181 and six credits of art history. [0-3]
- 285 (3) Sculpture I – The use of malleable materials to explore ideas of sculptural volume, mass, and shape. Prerequisites: FINA 181 and six credits of art history. [0-3]
- 286 (3) Sculpture II – Composing with rigid or pre-formed materials. The application of machine technology to sculpture. Prerequisites: FINA 181 and six credits of art history. [0-3]
- 287 (3) Two-Dimensional Studies – Techniques for painting, printmaking, or other two-dimensional media. Prerequisites: FINA 181 and six credits of art history. Not offered every year; emphasis varies. [0-3]
- 288 (3) Three-Dimensional Studies – Technical methods and the technology of sculpture and related three-dimensional art forms. Prerequisites: FINA 181 and six credits of art history. Not offered every year; emphasis varies with instructor. [0-3]
- 289 (3) Photography – An introduction to photographic techniques and picture making. Emphasis on camera and lighting techniques with some darkroom instruction. Prerequisites: FINA 181 and 6 credits of art history. [0-3]
- 290 (3) Lithography – The theory and practice of fine-art lithography with attention to the history of lithography in the fine arts. Prerequisites: FINA 181 and six credits of art history. [0-3]
- 327 (6) Archaeology of the Ancient Near East – (Also listed as RELG 300.) [0-2; 0-2]
- 329 (6) Greek and Roman Art – Emphasis on the architecture, sculpture, painting, and decorative arts of Greece and Rome. (Also listed as CLST 330.) [3-0; 3-0]
- 331 (6) Early Medieval Art – The transformation of Roman Imperial art into the medieval Christian arts of the Byzantine Empire and the Western European kingdoms, A.D. 100-1000. Offered in alternate years. (Also listed as RELG 326.) [2-1; 2-1]
- 333 (6) Architecture of the High Middle Ages – A study of the principal monasteries and cathedrals of Western Europe (c. 1000-1300), with a view to understanding their technical, aesthetic, and theological dimensions as well as the role of contemporary institutions in their creation. Offered in alternate years. [2-1; 2-1]
- 335 (6) Art of the Italian Renaissance from Giotto to Michelangelo – A survey of the principal works of art from the rise of the city-states (c. 1250) to the phenomenon of Mannerism in the 16th century; topics include the new conception of the artist and the changing role of the patron as well as the transformation of traditional artistic genres. [2-1; 2-1]
- 337 (6) Art of Western Europe, 1600-1800 – Manifestations in art of Catholicism as a European power: the absolutism of Louis XIV and Versailles; the bourgeoisie in Holland and Restoration England; and the urbanity and rationalism of 18th-century France, England, and Venice. [2-1; 2-1]
- 339 (6) The Emergence of Modern Art – The relationships between art and social change from the French Revolution to 1900; discussion of styles and movements includes neo-classicism, romanticism, impressionism, symbolism, and others. [2-1; 2-1]
- 340 (6) Directions in Twentieth-Century Art – A survey of the arts of Europe and the United States since the turn of the century; an examination of major artistic movements, the achievements of seminal artists, and the modernist phenomenon will provide keys for the understanding of today's art. [2-1; 2-1]
- 343 (6) Art in Canada – Art, artists, and art institutions from the establishment of the French and English colonies to the present; indigenous developments with particular attention to local vs. regional and national vs. international issues. [2-1; 2-1]

VANCOUVER OPERA

1995/96 Season

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- 347 (6) Modernism in European Architecture – Architectural design in continental Europe and Great Britain from the Enlightenment to the present; major movements and architects with particular attention to the antecedents and formulation of Modernism. Offered in alternate years. [2-1; 2-1]
- 348 (6) The Rise of North American Architecture – The emergence of a distinctive architecture from the early traditions of French Canada and the English colonies to the present; the growth of public and private patronage and contrasts between fashion and individual creativity. Offered in alternate years. [2-1; 2-1]
- 351 (6) History of Early Chinese Art – Traditions of Chinese art from the earliest historic ages through the Han and Tang Dynasties (c. A.D. 900), with stress on the importance of recent archaeological discoveries; the impact of Buddhism. Offered in alternate years. [2-1; 2-1]
- 352 (6) History of Chinese Painting – Paintings and painters from c. A.D. 800 to 1800, with stress upon both traditions and significant transformations of style and approach. Offered in alternate years. [2-1; 2-1]
- 353 (6) Buddhist Art of Japan – The development of Buddhist art traditions in the ancient capitals of Japan from the 6th to the 14th century, with reference to Buddhist art traditions in East Asia. Offered in alternate years. [2-1; 2-1]
- 354 (6) Japanese Painting Traditions – Changing modes of artistic perception in the art of painting in Japan, with emphasis on narrative, landscape, and genre painting traditions from the 12th to the 19th century. Offered in alternate years. [2-1; 2-1]
- 357 (6) Early South and Southeast Asian Art – Art and architecture from the Indus valley civilization, ca. 2300 B.C., to the 12th century, with an emphasis on Buddhism and Hinduism in India and their spread to Southeast Asia. Offered in alternate years.
- 358 (6) Later South and Southeast Asian Art – Art and architecture from the advent of Islam in India in the late 12th century to the present. Topics include the relationship of Mughal imperial architecture and painting to those of the Hindu Rajput courts, Hindu revivalism, and the colonial period. Offered in alternate years.
- 359 (6) Islamic Art and Archaeology – A study of the artifacts of Islam as an expression of Islamic beliefs (Also listed as RELG 341.) [0-2; 0-2]
- 363 (6) Arts of the Aztecs and their Predecessors – The historical development and symbolism of the architecture, monumental sculpture, mural painting, and funerary arts of the Aztecs and their predecessors including Olmec, Teotihuacan, and Toltec in ancient Mexico. Offered in alternate years. [2-1; 2-1]
- 365 (6) Dynastic Arts of the Classic Maya – Mayan art and architecture in Mexico and Central America, with emphasis on the dynastic cult during the Classic Period (A.D. 200-900), recent discoveries, and new interpretations, with discussions of Mayan astronomy and hieroglyphic writing. Offered in alternate years. [2-1; 2-1]
- 369 (6) North American Indian Art – A survey of the art and architecture of the indigenous peoples of the United States and Canada from pre-historic times to the present. [2-1; 2-1]
- 373 (3) The Literature of Art (Bibliography) – Introduction to library resources for primary and secondary research in art history. [0-3; 0-0]
- 375 (3) Approaches to Art History – Theories and problems in the study of art history. [0-0; 0-3]
- 380 (6) Studio Theory – A seminar in problems in contemporary art practice and related theory. Required course for all B.F.A. students. Entry restricted to students enrolled in the B.F.A. program. [0-3; 0-3]
- 381 (6) Intermediate Drawing – Drawing as a concentrated study. Analytical and perspective drawing. Entry restricted to students enrolled in the B.F.A. program. Prerequisite: FINA 281. [0-3; 0-3]
- 382 (6) Intermediate Painting – Development of personal style in painting technique. Entry restricted to students enrolled in the B.F.A. program. Prerequisites: FINA 281 and 282. [0-3; 0-3]
- 383 (6) Intermediate Printmaking – Fine-art printmaking techniques and imagery. Editioning, formal print quality, and exploration of multimedia printmaking. Entry restricted to students enrolled in the B.F.A. program. Prerequisites: FINA 281 and one of 283, 284, or 290. [0-3; 0-3]
- 384 (6) Intermediate Sculpture – Investigations of three-dimensional form through both plastic and structural means. Wood, metal, and other materials will be utilized. Entry restricted to students enrolled in the B.F.A. program. Prerequisites: FINA 281 and one of 285 or 286. [0-3; 0-3]
- 385 (6) Special Studies – Intermediate tutorial. Restricted to students enrolled in the B.F.A. program, by permission of and arrangement with the Department. Prerequisite: FINA 281. [0-3; 0-3]
- 386 (6) Intermediate Photography – An investigation of approaches to photography and its meaning in the context of contemporary art. Restricted to students enrolled in the B.F.A. program. Prerequisite: FINA 289.
- 387 (6) Studio Media: Painting and Drawing – Exploration of basic drawing and painting concerns. Priority given to students enrolled in B.A. in Studio Arts, and B.A. Major and Honours students in Fine Arts. Prerequisites: FINA 181 and six credits of art history. [0-3; 0-3]
- 388 (6) Studio Media: Printmaking – Introduction to intaglio and relief printmaking with emphasis on metal-plate etching; other methods may also be considered. Priority given to students enrolled in B.A. in Studio Arts, and B.A. Major and Honours students in Fine Arts. Prerequisites: FINA 181 and six credits of art history. [0-3; 0-3]
- 389 (6) Studio Media: Sculpture – Basic sculpture, including both plastic and structural approaches to form; assemblage technique; particular attention to articulation of space. Priority given to students enrolled in B.A. in Studio Arts, and B.A. Major and Honours students in Fine Arts. Prerequisites: FINA 181 and six credits of art history. [0-3; 0-3]
- 390 (6) Studio Media: Photography – Exploration of basic approaches to photography in the context of contemporary art. Priority given to students enrolled in the B.A. in Studio Arts, and the B.A. Major and Honours students in Fine Arts. Prerequisites: FINA 181 and 6 credits of art history. [0-3; 0-3]
- 393 (6) History of the Film – Study of the development of film from its origin to the present, including the pre-history of film, silent film, the introduction of sound, the major movements and film makers of the last ninety years. (Also listed as THTR 330.) [2-2; 2-2]
- 397 (6) Directed Study Abroad (Summer School)
- 429 (3/6) d Studies in the Art and Archaeology of Greece and R – (Also listed as CLST 429.) Prerequisite: CLST 330 or permission of the instructor.
- 431 (6) Seminar in Early Medieval Art [0-3; 0-3]
- 433 (6) Seminar in Medieval Art [0-3; 0-3]
- 435 (6) Seminar in 15th and 16th Century Art [0-3; 0-3]
- 437 (6) Seminar in 17th and 18th Century Art [0-3; 0-3]
- 439 (6) Seminar in 19th Century Art [0-3; 0-3]
- 440 (6) Seminar in 20th Century Art [0-3; 0-3]
- 443 (6) Seminar in Canadian Art [0-3; 0-3]
- 448 (6) Seminar in North American Architecture [0-3; 0-3]
- 451 (6) Seminar in Chinese Painting [0-3; 0-3]
- 453 (6) Seminar in Japanese Art [0-3; 0-3]
- 455 (6) Seminar in the Art of India and Southeast Asia [0-3; 0-3]
- 463 (6) Seminar in Aztec Art [0-3; 0-3]
- 465 (6) Seminar in Mayan Art [0-3; 0-3]
- 469 (6) Seminar in North American Indian Art [0-3; 0-3]
- 480 (6) Advanced Seminar – Required course for all B.F.A. students. Readings in art theory and criticism. Entry restricted to students enrolled in the B.F.A. program. [0-3; 0-3]
- 481 (9) Advanced Drawing – Entry restricted to students enrolled in the B.F.A. program. [0-6; 0-6]
- 482 (9) Advanced Painting – Entry restricted to students enrolled in the B.F.A. program. [0-6; 0-6]
- 483 (9) Advanced Printmaking – Entry restricted to students enrolled in the B.F.A. program. [0-6; 0-6]
- 484 (9) Advanced Sculpture – Entry restricted to students enrolled in the B.F.A. program. [0-6; 0-6]
- 485 (9) Advanced Special Studies – Entry restricted to students enrolled in the B.F.A. program. [0-6; 0-6]
- 486 (9) Advanced Photography – Entry restricted to students enrolled in the B.F.A. program. [0-6; 0-6]
- 487 (6) Tutorial in Studio Prerequisite: one of FINA 387, 388, 389 or 390. [0-3; 0-3]
- 499 (6) Honours Essay
- 531 (3/6) d Studies in Early Medieval Art
- 533 (3/6) d Studies in Medieval Art
- 535 (3/6) d Studies in the Art of the Renaissance
- 537 (3/6) d Studies in 17th and 18th Century Art
- 539 (3/6) d Studies in 19th Century Art
- 540 (3/6) d Studies in 20th Century Art
- 543 (3/6) d Studies in Canadian Art
- 548 (3/6) d Studies in North American Architecture
- 551 (3/6) d Studies in Chinese Art
- 553 (3/6) d Studies in Japanese Art
- 555 (3/6) d Studies in South and Southeast Asian Art
- 561 (3/6) d Studies in the Indigenous Arts of the Americas
- 571 (6) The Methodology of Art History – Required of all art history graduate students.
- 577 (3/6) c Directed Reading
- 580 (0) Major Essay – (M.F.A. only.)
- 581 (12) Studio V – Special course for students enrolled in the first year of the M.F.A. program.
- 582 (12) Studio VI – Special course for students enrolled in the second year of the M.F.A. program.
- 599 (6) Master's Thesis
- 649 Ph.D. Thesis

Fire Protection Engineering FPE
FACULTY OF APPLIED SCIENCE

- 501 (3) Combustion I – Fundamentals of combustion including material and energy balances, chemical thermodynamics, kinetics, premixed and diffusive burning. Advanced topics in the theory of combustion, flame propagation, efficiency of combustion as well as the physico-chemical properties of combustible material.
- 502 (3) Combustion II – Fire dynamics from ignition through heat transfer to growth and spread of fires and their suppression. Factors such as containment and its role in the dynamics of fires and explosions. Prerequisite: FPE 501.
- 503 (6) Suppression Systems – Principles of fire suppression using water and other extinguishing agents. Analysis and design of hydraulic systems to meet established performance criteria. Design of systems using specialized extinguishing agents.
- 504 (3) Fire and Life Safety Analysis – Fire testing and fire resistance of materials and structural assemblies; smoke

- yields and toxicity. The role of compartmentation, smoke control, fire detection and suppression systems in actual structures. Principles of safe egress and evacuation time. Codes and standards as illustrations of fire and life safety provisions. Modelling techniques for predicting fire behaviour.
- 505 (3) Fire Detection and Control Systems Instrumentation – Principles of fire detection devices; heat, photo electric, ionization, flame and other detectors. Fire alarm control system design for computer-based data gathering and data transmission, zoned and addressable systems. Integration of such devices into complete fire protection systems for commercial, industrial and municipal applications.
- 506 (3) Fire Protection Management – Fire statistics, codes and regulations, fire prevention and fire protection strategies and emergency planning. Cost-benefit analysis for fire protection solutions and fire protection management.
- 507 (3) Fire Protection Case Studies – Examination of industrial and commercial facilities with respect to hazards and fire protection provisions. Study of fire loss investigation and loss reports with site visits. Hazard analysis, fault tree analyses and failure predictability for assessment of industrial processes.
- 598 (6) Fire Protection Engineering Project/Report – Preparation of a comprehensive analysis/design or report concerning fire and fire safety of a community or a specific industrial/commercial facility.

Fisheries Research FACULTY OF GRADUATE STUDIES

FISH

- 500 (3) Issues in Fisheries Research: Seminars - Fisheries Management
- 501 (3) Issues in Fisheries Research: Freshwater
- 502 (3) Issues in Fisheries Research: Marine
- 505 (3) Issues in Fisheries Research: Policy

Food Science FACULTY OF AGRICULTURAL SCIENCES

FOOD

- 258 (3) Exploring Our Food – Changing pattern of world food supply and needs; chemical and physical properties of our food; issues of safety, nutritive value and consumer acceptability of food; government regulations in relation to food quality and safety; fabrication and processing of food. This course is intended primarily for non-Food Science majors. [0-0; 3-0]
- 259 (3) Introduction to Food Systems – A study of the characteristics of animal and plant tissues and fluids that are important to their transformation into food products. [0-0; 3-2]
- 301 (3) Food Chemistry – Constituents of food and their properties including carbohydrates, proteins, lipids, pigments, flavours and vitamins. Prerequisite: CHEM 203 or 230. [3-2; 0-0]
- 302 (3) Analytical Methods – Principles and procedures for the analysis of food products. [0-0; 2-3]
- 303 (3) Quality Control, Standards and Evaluation – Laws and regulations governing food composition, grading and quality; statistical quality control. Prerequisite: PLST 321 or equivalent. [0-0-0; 2-2-1]
- 308 (3) Principles of Food Process Science I – A study of preservation of tissue and fluid food systems by thermal processing, cooling and freezing with emphasis on product-process interactions. [3-2; 0-0]
- 309 (3) Principles of Food Process Science II – A study of preservation of tissue and fluid food systems by selected physical and chemical treatments with emphasis on product-process interactions. [0-0; 3-2]
- 401 (3) Food Process Science - Food Fabrication – Computer-aided techniques of optimization and multivariate analysis; chemistry of food ingredients. [2-2; 0-0]

- 402 (3) Food Process Science - Nutritive Aspects – The theory and practice of modification and evaluation of the nutritive properties and safety of preserved and fabricated food systems. Prerequisite: ANSC 322 or HUNU 203 or 305. [0-0; 3-2]
- 404 (3) Food Analysis: Physical and Sensory Methods – Evaluation of physical and sensory attributes of food systems, including colour, odour, taste and texture; physiological basis of sensory perception; sensory analysis methodology. [3-2; 0-0]
- 405 (3) Seafood Process Science – Chemical, microbiological, physical and sensory factors important in the conversion of finfish, shellfish and crustaceans to food products. On-board handling of seafood resources. Post-mortem muscle changes. Low temperature and thermal preservation. Further processing of seafoods. Quality assessment methods for seafoods. Prerequisite: CHEM 230. [0-0; 3-2]
- 410 (3) Chemistry of Food Systems – Physico-chemical aspects of sol-gel and liquid-solid transformations; chemistry of multi-phase food systems. [3-0; 0-0]
- 414 (3) Applied Microbiology – Microbiological culture techniques for the production of materials of significance in Food Science. Prerequisite: MICB 200. [2-2; 0-0]
- 416 (3) Environmental Bromatology and Public Health Implications – Dynamic interaction between environmental components and food systems. Intrusion of micro-organisms and toxic compounds into food systems. Sanitation methodology. Strategies in food safety inspection. Physical and chemical protection of food. [3-2; 0-0]
- 418 (3) Toxicants in Food Systems – Chemical, physical and biological properties of toxicants in food systems. Degradation of toxicants during food processing. [0-0; 3-0]
- 423 (2) Undergraduate Seminar
- 430 (2-6) c Directed Studies
- 499 (6) Undergraduate Thesis – Design and execution of an experimental/analytical research project leading to preparation of a thesis. Consult with the Head of the Department before the end of classes in third year.
- 500 (2) M.Sc. Seminar
- 501 (2) Food Lipids – Chemical and physical properties of food lipids. Chemical alteration of food lipids during processing and storage; hydrogenation, crystal polymorphism, hydrolysis, thermal degradation and autoxidation. Offered in alternate years.
- 502 (3) Food Pigments and Colorimetry – Deterioration of food pigments and synthetic food colours during processing; colour perception and instrumental analysis. Offered in alternate years.
- 503 (2) Chemistry of Food Proteins – Chemical and physical properties of food proteins. Offered in alternate years.
- 504 (2) Molecular Basis of Chemoreception – Chemical and physical processes underlying the sensory properties of food. Offered in alternate years.
- 505 (2) Food Suspensions, Emulsions and Foams – Physico-chemical concepts of food suspensions, emulsions and foams; surface-active agents, hydrophile-lipophile balance, emulsifiers, emulsion stability, foaming and antifoaming agents, foam stability, and rheology of these food systems. Offered in alternate years.
- 506 (3) Structure and Chemistry of Food Myosystems – Structural and chemical aspects of myosystems as related to fundamental properties and quality attributes of muscle as a food with emphasis on texture and flavour. Offered in alternate years.
- 507 (2) Food Carbohydrates – Chemical, physical and structural aspects of simple sugars and polysaccharides such as starch granules, gums and pectins. Concepts of carbohydrate alterations during food processing and storage; nonenzymic browning reactions, starch granule gelatinization and retrogradation, depolymerization of polysaccharides, and polysaccharide-protein interactions in food. Offered in alternate years.

- 508 (3) Biorheology – Rheology of complex biological systems; biorheometry; rheological studies of selected biological tissues with emphasis on food systems. Offered in alternate years.
- 509 (2) Food Enzymes – Chemical and physical properties of food enzymes; mechanisms of enzymic action; utilization of enzymes in food processing. Offered in alternate years.
- 512 (2) Low Temperature Preservation of Food – Structure and properties of water and ice in food systems. Water activity of food. Metabolic processes and quality deterioration in fresh commodities during refrigerated storage. Physico-chemical and quality changes in frozen food. Process techniques for the chilling and freezing of food. Dynamics of freeze-drying. Prerequisites: FOOD 301 and 308 or permission of instructor. Offered in alternate years.
- 513 (3) Advanced Food Fermentation – Current advances in food fermentation. Prerequisite: FOOD 414. Offered in alternate years.
- 516 (2) Advanced Environmental Bromatology – Lectures and seminars dealing with mechanisms of biological intrusion into and degradation of food systems. Current theories on chemical, physical and biological control of microbial activity in food systems and on food contact surfaces. Current advances in detection of pathogenic and physiologically-injured microorganisms in food systems. Prerequisites: MICB 200, FOOD 416. Offered in alternate years.
- 518 (2) Food Toxicology and Assessment – Source, properties and formation of toxicants in food; detection methods; processes for removal from food; risk assessment. Prerequisites: FOOD 301; FOOD 418. Offered in alternate years.
- 530 (2-6) c Directed Studies
- 549 (12) Master's Thesis
- 600 (2) Ph.D. Seminar
- 649 Ph.D. Thesis

Forestry FACULTY OF FORESTRY

See courses below under Forest Operations, Forestry, Natural Resources Conservation and Wood Science and Industry

Forest Operations FOPR

- 260 (3) Forest Engineering Economics – Detailed methods of planning and analysis of economic problems encountered in harvesting operations. Corequisite: ECON 100. [2-2; 0-0]
- 262 (3) Forest Operations I – Introduction to systems and analyses used in forest operations. Topics include harvesting system design, forest operations as an integral component of silvicultural systems, elementary road design and location, and planning forest operations to meet integrated resource objectives. Prerequisite: FOPR 263. [2-3; 0-0]
- 263 (2) Basic Forest Surveying – An introduction to the basic techniques of surveying with emphasis on forest harvesting. This course should be taken in the week preceding lectures in second year.
- 352 (2) Harvesting Field Trip – A 5-day field trip immediately prior to the fall term of third year to demonstrate current harvesting practices and their implications on silviculture, management, protection and utilization in representative forest types. A substantial written report is required as part of the course. Fees will be assessed to meet expenses. (See index - Fees "Special Fees".)
- 359 (3) Cable Mechanics – Engineering aspects of cable logging systems. Calculation of tensions, load carrying capability and load paths of common cable systems. Analysis of guyline tensions and anchor loads. Application of computers to cable design and layout. Prerequisite: PHYS 170. [2-2; 0-0]

- 362 (3) Forest Operations II – Detailed analysis of the engineering, economic, environmental, and aesthetic factors influencing forest operations planning. Topics on advanced forest road location, slope stability, harvest unit design, harvest scheduling in an integrated resource framework are centered around practical planning projects. Prerequisite: FOPR 262. [0-0; 2-2]
- 363 (3) Forest Soil Mechanics – Physical and hydraulic properties of soils for engineering design, seepage and erosion control, and strength parameters for slope stability analysis. Prerequisite: FOPR 262, PHYS 170. [0-0; 3-2]
- 359 (3) Analysis of Harvesting Operations – A capstone project-based course for forest operations students. Computer applications, statistical analyses and operations research techniques applied to forest operations. Prerequisite: Restricted to Forest Operations majors. [0-0; 2-2]
- 363 (3) Forest Roads and Bridges – Analytical techniques for determining the bearing capacity of roads, design of bridge abutments, piled foundations, and simply supported bridge spans. Prerequisites: FOPR 363, CIVL 228 or WOOD 376. [3-2; 0-0]
- 361 (3) Forest Transportation Systems – Technical, economic and environmental aspects of forest transportation methods. Topics include vehicle performance and design, transportation network analysis, facilities location and materials handling processes. Prerequisite: PHYS 170 and FOPR 262 [0-0; 2-2]
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- Forestry**
- 100 (2) Introduction to Forestry – An overview of forestry. History of forestry and the forestry profession, present status and role of forestry, forest policy and future trends in use of forest resources. [2-0; 0-0]
- 111 (6) Dendrology – Development, anatomy, morphology, function and autecology of trees. Prerequisite: Biology 12 or BIOL 110 or 115 (corequisite). [3-2; 3-2]
- 202 (3) Forest Ecology – The Ecosystem concept: energy biomass and nutrient cycling; the physical environment: population and community ecology; succession. Biogeoclimatic classification and some coastal ecosystems. Role of forest ecology in evaluating environmental issues. Corequisites: FRST 111; SOIL 200 or 300; SOIL/GEO 204 strongly recommended. [3-2; 0-0]
- 203 (3) Silvics of Forest Trees of Western Canada – Ecological and silvical characteristics of forest trees; assessment of ecological site quality and biogeoclimatic classification; application of silvics in silviculture. A plant herbarium of at least 50 species is required. Prerequisite: FRST 202. [0-0; 3-2]
- 231 (3) Introductory Biometrics for Forestry – Basic theories of probability and statistics. Sampling distribution, methods of estimation and hypothesis testing; goodness of fit and tests for independence; analysis of variance, regression and correlation. Corequisite: MATH 100 or 111 or 140. [3-2; 0-0]
- 232 (3) Computer Applications in Forestry – Techniques involved in solving forestry problems with microcomputers using word processing, spreadsheet, procedural language, and data base management tools. [0-0; 3-2]
- 237 (3) Introduction to Forest Mensuration and Photogrammetry – Measuring and estimating tree volumes, form and taper. Timber scaling and grading. Computer applications. Basic photogrammetry, mapping for photography and photo-based inventory systems. Prerequisite: FRST 231 Corequisite: FRST 232 [0-0; 3-2]
- 238 (3) Forest Mensuration – Forest inventory methods. Growth and yield prediction. Applications of multiple linear regressions and sampling techniques. Regeneration and residue surveys. Introduction to multiple resource inventories. Prerequisite: FRST 237; MATH 101 or 141. [3-2; 0-0]
- 252 (2-6) d Field Study Tour – Directed field experience for first or second year students in one of the major forest-producing regions of the world. A post-tour report is required.
- 290 (3) Recreation Resource Administration and Management – Study of the nature of management and conservation of wildland recreation resources; basic elements of recreation land use planning; recreation in forest management plans on public lands; tools of recreational land management. [2-2; 0-0]
- 292 (3) Recreation Site Planning – Fundamentals of recreation site selection, site planning and conservation of non-timber values in wildland settings, inventory of recreational features and related habitat, visual, heritage and subsistence resources; analysis of sensitivity of wildland recreation areas. [2-2; 0-0]
- 300 (6) Principles of Forest Sciences and Management – Introduction to the biology underlying tree and stand growth and development, silvics and silviculture and techniques for managing the forest for a diversity of products and benefits. (Not available for credit to undergraduate forestry students; no prerequisites.) [3-0; 3-0]
- 302 (3) Forest Genetics – Population genetics and conservation of genetic resources; principles of genetics and their application to forestry. [0-0; 2-2]
- 305 (3) Silviculture I – Silviculture concepts and principles: artificial regeneration and stand establishment; principles of forest tree improvement, seed handling, nursery practices, site preparation and vegetation management. Prerequisites: FRST 203; FRST 351 recommended. [3-4; 0-0]
- 306 (3) Silviculture II – Natural regeneration requirements and stand tending practices; stand density management, pruning and fertilization. Silvicultural systems: silviculture guides and development of prescriptions; elements of decision making, monitoring and control systems; con-

Ministry of Forests Regional Managers

The British Columbia Forest Service is interested in recruiting highly motivated and progressive individuals to meet the integrated resource management challenges of the 90's and to implement the country's most progressive Forest Practices Code. The Ministry offers exciting professional opportunities throughout the province. Please contact the individuals below for more information on the exciting prospects we offer.

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Ken Collingwood
2100 Labieux Road
Nanaimo, BC V9T 6E9
Phone: (604) 751-7164
Fax: (604) 751-7196

- nections to forest level planning. Prerequisites: FRST 305. [0-0; 3-1²]
- 308 (2) Forest Entomology – An introduction to insects which cause damage to forests and forest products; how insects live; life cycles and attack symptoms of representatives of major groups of insects; principles for control and management. [2-2; 0-0]
- 309 (2) Forest Pathology – Biology and management of forest tree diseases. Prerequisite: FRST 203. [0-0; 2-4²]
- 311 (3) Plant Physiology I – Mechanisms and regulation of functional processes contributing to the assimilation, transport and utilization of water, mineral nutrients and carbon by plants. CHEM 230 is strongly recommended. (Same as BIOL 351 and PLNT 321.) [3-2; 0-0]
- 312 (3) Forest Soils – Forest soil properties, processes, and fertility; forest soils in relation to resource management. (Also offered as SOIL 403.) Prerequisite: SOIL 200. [3-2; 0-0]
- 319 (3) Principles of Forestry Economics – Introduction to the economics of production, distribution and consumption of goods and services produced by, and dependent on, the forest resource. Prerequisite: ECON 100. [3-1; 0-0]
- 327 (2) Forest Fire Science and Management – Ecological effects of fire; fire behaviour; fire danger rating; principles of fire management and prescribed fire use. Prerequisites: SOIL 200, FRST 202. [2-4²; 0-0]
- 332 (3) Introduction to Applied Mathematical Programming for Forestry – Decision analysis, linear programming, and computer simulation applied to forestry problems. Prerequisites: MATH 101, FRST 232 [0-0; 3-1]
- 348 (2) Forestry Technical Essay – An essay of not less than 2,000 words. Detailed instructions along with appropriate dates for submission of the outline and final copy are available from the Forestry office.
- 351 (3) Interior Field School – Seven working days of field study at a southern interior B.C. location immediately prior to the commencement of third year. This course, which is required of all forestry students in the Forest Resources Management, Forest Operations and Forest Science Major programs before they enter the third year of the program, will focus on land use, management and silviculture in the study area. Fees will be assessed to meet the expenses. (See index - Fees "Special Fees")
- 387 (3) Forest Hydrology, Watershed Management and Forestry – Application of the principles of forest hydrology to watershed management; forest harvesting impacts on the recreational and commercial fishery. [0-0; 3-2]
- 392 (3) Recreation and Resource Planning – Lectures and demonstrations outlining concepts, and component elements of regional recreation planning in theory and in practice. [0-0; 2-2]
- 395 (3) Forest Wildlife Ecology and Management – Biology of important bird and mammal species resident in forested regions, with particular emphasis on the influences of silvicultural and logging practices. [0-0; 3-2]
- 399 (4) Research Methods – Lectures and seminars in research philosophies and the scientific method, with special emphasis on field research. [2-0; 2-0]
- 403 (3) The Sustainability of Production in Managed Forest Ecosystems – Study of the functional and dynamic characteristics of forest ecosystems and their response to forest management using ecosystem-level microcomputer simulation models. Prerequisite: FRST 203. [3-2; 0-0]
- 404 (4) Advances in Silviculture – Fundamental silvicultural problems; the application of research findings to the practice of silviculture. Prerequisite: FRST 305, 306. [0-0; 4-0]
- 405 (3) Forest Ecosystems – Ecosystem classification of B.C. forest land. The biogeoclimatic classification of B.C. as a basis for forest land management. [2-2; 0-0]
- 406 (3) Advanced Forest Pathology – Hereditary, physiological, anatomical, environmental, and microbiological factors influencing forest tree diseases. Prerequisite: FRST 309 (Given alternate years). [2-2; 0-0]
- 407 (1) Vegetation Management – Theory of plant competition and vegetation dynamics; the biology of weedy and invasive species; assessment of vegetation problems; principles and techniques of forest vegetation control; impacts of vegetation management methods. Prerequisites: FRST 305, or PLNT 304 or 338, or BIOL 302 or 303. [0-0; 1-0]
- 408 (3) Problems of Forest Entomology – Decision-making in the protection of forests from insects. Insect problems viewed from other disciplines of forestry. Basics of biological and economic evaluation, and choice of control methods. [0-0; 2-2]
- 415 (2) Forest Policy – The development, implementation and analysis of forest policy. Prerequisite: ECON 100. [0-0; 2-1]
- 418 (3) Economics of Silviculture – Economic analysis of individual silvicultural practices and silvicultural regimes; economic impact of large scale reforestation and silvicultural programs; institutional incentives and disincentives for silviculture investments. Prerequisites: FRST 319 or FOPR 260. Corequisite: FRST 306. [0-0; 3-0]
- 419 (3) Economics of the Forest Sector – Basic economic constructs used to analyze key features of the forest sector including product prices, input prices, production levels, trade patterns and aggregate levels of product consumption. Prerequisites: ECON 100; MATH 100 or 140. [0-0; 3-0]
- 420 (3) Forest Environmental Management – Forestry impacts upon environment; man's relationship to the forest; interactions of industrial forest practice with other resource uses, their economic implications and relevance; approaches to and problems of maintaining environmental quality. [2-2; 0-0]
- 421 (3) Integrated Resources Management I – Introduction to the quantitative tools necessary in forest management. Prerequisite: FRST 238, 332. Corequisite: FRST 319 or FOPR 260. [3-2; 0-0]
- 422 (3) Land Information Systems – Philosophy and methods of data collection, analysis and classification of land for multiple uses. Laboratories emphasize Geographic Information Systems. (This course is the same as SOIL 417.) [0-0; 2-4]
- 423 (3) Integrated Resources Management II – The design of forests with respect to the availability of an array of values across time and across the geographic area of the forest. Prerequisite: FRST 421. [0-0; 2-4]
- 427 (3) Advances in Forest Fire Science and Management – Fire in ecosystems; forest fire management policies; advanced fire management and use of prescribed fire; the application of research findings to fire management. Prerequisite: FRST 413. [0-0; 2-4]
- 430 (3) Advanced Biometrics – Analysis of variance, multiple regression and analysis of covariance. Design and analysis of experiments. Prerequisite: FRST 231. [3-2; 0-0]
- 431 (3) Sampling Methods – Theory and design of sampling techniques with emphasis on application to natural resources. Prerequisite: FRST 238. [0-0; 3-1]
- 435 (3) Computer-based Image Analysis for Forest Inventory – The digital processing of remotely sensed image data for forest inventory. Techniques for acquiring, calibrating, registering, enhancing and interpreting digital satellite data. Digitized planimetric and topographic map data bases. Case studies of existing forest inventory systems. Prerequisite: FRST 237. (Same as CPSC 435.) [0-0; 2-2]
- 436 (3) Growth and Yield – Techniques of growth and yield projection and discussion of modelling approaches. Exploration of stand dynamics, quantitative implications of management treatments and environmental limitations to tree and stand growth. Prerequisite: FRST 238. [0-0; 2-2]
- 439 (3) International Forestry – The socio-economic, biological and technological aspects of forestry within the international frame, in both the developed and developing world. Regional studies and the role of national and international agencies. (Non-forestry students must have instructor's permission.) [2-2; 0-0]
- 442 (3) Photo-Interpretation of Forest Lands – Landform identification and terrain analysis from air photographs, application to forest and agricultural land mapping. This course is the same as SOIL 442. [2-2; 0-0]
- 443 (3) Remote Sensing in Forestry and Agriculture – Basic biological concepts related to interpretation of remote sensing data for land management, including the use of films and filters, and interpretation of air photographs, and other imagery. (Same as SOIL 443) [2-2; 0-0]
- 445 (1) Seminar – Oral presentation and discussion of current forestry topics; reviews of important papers in forest periodicals. [0-1; 0-1]
- 449 (1-6) 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.
- 451 (6) Field Work in Harvesting, Silviculture and Mensuration – To be taken in the April and May preceding a student's final year at UBC. Fees will be assessed to meet the expenses. (See Index - Fees "Special Fees".)
- 452 (2-6) Regional Field Studies in Forestry and Forest Products – Directed field experience in one of the major forest-producing regions of the world. Pre-tour seminars and post-tour reports are required.
- 462 (3) Industrial Forest Management – The relationships, interactions, functions, and objectives of the companies, governments, unions, and associations which make up the forest industry. [2-2; 0-0]
- 485 (2) Forest Watershed Management – Effects of land management on quality, quantity and timing of water flow. Prerequisite: FRST 387. [2-2; 0-0]
- 486 (3) Forestry, Water Quality, and Fish – Physical, chemical, and biological quality of aquatic ecosystems and the impacts of forest industry and forest management practices on water quality and fish. Given in alternate years commencing 1988-89. Prerequisites: FRST 385, 386. [2-3; 0-0]
- 490 (3) Visual Resource Management – Methodologies for analysis, design and management of the visual guidelines; operational policies of resource extraction industries and the implication on multiple land use management. (Same as LARC 340) [0-0; 2-2]
- 495 (3) Biological Diversity and Forest Management – Principles, problems, and practices of managing forests and nature reserves for biological diversity; integration of forestry and wildlife with particular emphasis on diversity of all life forms. Class field studies designed to examine diversity in managed forests with subsequent data analysis and technical report writing. Prerequisite: FRST 202. [2-2; 0-0]
- 497 (2) Graduating Essay or Technical Report – A technical description of a study or a detailed literature review of at least 4,000 words, developed under the guidance of a Faculty member. Available only to students in their graduating year.
- 498 (6) B.Sc. Thesis in Forestry – An independent study or research project of a subject of special interest to the student under the direction of a staff member. The subject must be appropriate to the student's area of concentration.
- 499 (6) B.S.F. Thesis – An independent study or research project on an approved topic, developed under the guidance of a Faculty member. Available only to students in their graduating year.
- 500 (2-6) Studies in Forest Tree Physiology – Principles of plant physiology as applied to problems in growth and development of tree species.
- 501 (3) Forest Tree Improvement – Identification and utilization of genetic variation in forests and forest trees. Prerequisites: FRST 302, 430. Offered in 1987/88 and alternate years.

Best wishes to the Faculty, Staff and Students

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- 523 (2-6) c Advanced Studies in Forest Management – Problems in forest and land management planning and development of forestry or forest industry programs.
- 525 (2-6) c Problems in Forest Land Management – Directed studies in various aspects of forest management including forest-level modelling, valuation of resources and economic considerations.
- 527 (2-6) c Studies in Forest Fire Science and Management – Directed studies in forest fire science and management.
- 529 (2) Seminar in Management of Forest Resources – Objectives and methods for integration and improvement of management and use of forests and associated wildlands.
- 530 (3) Multiple Regression Methods – Matrix algebra; algebra and inference of multiple linear and multiple curvilinear regressions for solution of problems in forestry and related fields. Non-linear regression. Methods of least squares for analysis of variance and covariance. Given in alternate years.
- 531 (3) Multivariate Statistical Methods – Multivariate analysis of variance, cluster, principal components, factor, canonical and discriminant analysis. Theory and conceptual background are presented but emphasis is on selection of appropriate analysis and interpretation of results. Examples from forestry and related fields are analysed by computer programs at UBC.
- 532 (2-6) c Data Processing in Forestry – Selected readings and problems in the collection and analysis of data in forestry. Use of electronic computers for special forestry and forest research problems. Prerequisite: A good working knowledge of a programming language, preferably FORTRAN.
- 533 (2-6) c Problems in Statistical Methods – Directed studies in problems of advanced statistical techniques as a tool in forest research.
- 536 (2-6) c Advanced Studies in Forest Mensuration – Development and analysis of forest inventory systems; sequence and patterns of tree growth; analysis of crown development; improvement of stand growth and yield; methods of biomass analysis.
- 539 (2-6) c Problems in Forest Sampling
- 542 (2-6) c Advanced Studies in Forest Photogrammetry – Problems in photo-interpretation, photo mensuration and forest land classification.
- 543 (2) Selected Topics in Remote Sensing – A weekly two-hour seminar series in applied aspects of remote sensing pertaining to natural resources topics; included are uses of remote sensing in forest appraisal, forest recreation, wildlife and soils.
- 545 (2) General Forestry Seminar – Selected topics in Forestry and Wood Sciences. (Note: Either FRST 545 or 584 will be required for the first year of all graduate students in Forestry. One or more of FRST 514, 529, 546 and 584 to be taken concurrently, or subsequently.)
- 546 (4) Research Methods – Lectures and seminars in research philosophies and methods with special emphasis on field and applied research. [2-0; 2-0]
- 547 (2) Seminar in Forest Harvesting – Selected topics in forestry and harvesting.
- 548 (3) Major Essay – For non-thesis Master's Degree Programs.
- 549 (6/12/18 c) Master's Thesis
- 555 (6) Dynamic Programming in Resource Allocation – Mathematical background, classical optimization methods, principle of optimality in one, two, and three dimensions; dimensionality reduction; feedback mechanisms; examples from Forestry and Natural Sciences. Prerequisites: linear algebra, calculus, probability theory, or consent of instructor.
- 559 (2-6) c Operations Research in Forestry – Directed studies in the application of O.R. techniques to the diverse problems of the forest environment and forest industries.
- 560 (3) Advanced Analysis of Harvesting Operations – The application of advanced analytical methods to problems in harvesting. Development of proficiency in problem formulation, commercial software, and interpretation of results. Topics include linear, integer, non linear, and dynamic programming; classical optimization; simulation; bounding and search techniques.
- 561 (3) Modeling and Simulation of Harvesting Operations – Principles and methodology for performing simulation experiments. Emphasis is placed on building, running, and analyzing network-based simulation models applicable to many harvesting operations.
- 562 (2-6) c Microcomputer Applications in Forest Engineering – Directed studies in analyzing microcomputer applications related to the planning, analysis and design of harvesting operations.
- 563 (2-6) c Problems in Forest Engineering – Directed studies in planning and control of logging systems; special design problems of forest roads, bridges, cableways and associated structure.
- 564 (3) Research Methods in Forest Harvesting – A lecture and laboratory course covering the major research methods applicable to the study of forest harvesting operations. Topics covered include experimental design, production studies, and economic analysis.
- 565 (3) Transportation Network Planning – Determination of optimal road spacing, road standards under assumptions of irregular cutting boundaries, non-uniform timber volumes, non linear cost functions, and multiple stand entries. Examination of large scale transportation network optimization.
- 566 (3) Mechanics of Ground Vehicles – Analysis of forces influencing the payloads and mobility of wheeled and tracked vehicles. Ground pressures and dynamics of the wheel-soil interface. Mechanics and energy transfers for engines, torque converters, transmission, differentials, and planetary gears.
- 567 (3) Advanced Cable Mechanics – Advanced topics in cable mechanics, including multi-span systems, yarder mechanics, spar and tail-tree analysis.
- 570 (2-6) c Wood Science – Research in basic wood and fibre properties; anatomy, chemistry and physics; analysis of variation in wood qualities; chemistry of wood extractives.
- 571 (3) Biodeterioration and Wood Protection – Recent advances in understanding the factors influencing the performance of wood in service. Topics will be selected from: bacterial and fungal degradation of wood, novel application technologies, accelerated testing of preservatives, factors influencing preservative performance. Prerequisites: WOOD 371, 372, and 473.
- 572 (2-6) c Energy Transfer Mechanisms in Wood and Related Pro – Response of high polymers to energy sources with special reference to chemical and physical effects on wood and related products; cross-linking, copolymerization and degradation reactions; ionizing radiation.
- 573 (3) Wood-fluids Relationships – Wood sorption theories and thermodynamics, hygroexpansion; Darcian and non-Darcian flow of fluids in wood; coupled heat and moisture transfer; electrical and acoustical properties of wood. Prerequisites: MATH 200, WOOD 372.
- 574 (2-6) c Rheological Behaviours of Wood Base Materials – Time-dependent phenomena of the wood matrix and wood fibre webs; relation of polymer constructions with emphasis on wood molecular architecture; features of viscoelastic memory systems. Corequisites: WOOD 375 and MATH 300.
- 575 (2) Wood and Industry – Cellular nature of wood; the ultrastructural characteristics of the woody cell wall and tree growth in relationship to wood properties. Timber supply, production, markets and industry trends of the forest products industry. [2-0]
- 576 (3) Advanced Wood Mechanics – Analysis and design of structural wood products, influences of material

- inhomogeneity and variability; creep and time dependent fracture phenomena; structural performance of wood products such as panel products, lumber, glued laminated timber and I-Beams. Impact of codes on marketing of structural wood products.
- 577 (2-6) c Origin of Wood Pulp Properties – Exploration of basic interrelationships between wood characteristics, chemical and mechanical processing and wood pulp behaviours. Corequisites: WOOD 377 and 473.
- 578 (2-6) c Advanced Studies in Wood Products – Research in the properties of solid and reconstituted wood products.
- 579 (3) Forest Products Biotechnology – Uses of microbiology, enzymology and immunology to enhance the processing and value of forest products.
- 580 (2-6) c Problems in Forest Products – Directed study in problems associated with the forest industries; utilization; integration; development and marketing of forest products.
- 581 (3) Forest Products Marketing/Management – Options available to the forest products industry with emphasis on methods of strategic analysis. Industry structure; business environment limitations; a practical market assessment. Prerequisite: WOOD 461.
- 582 (4) Chemical and Biological Aspects of Wood – The chemical nature of wood; the chemical aspects of protective treatments and the fundamental interactions between bacteria/fungi and wood. The application of micro-organisms and enzymes to wood processing. Lectures and a laboratory component. Prerequisites: CHEM 230 or equivalent organic chemistry course and one of: BIOL 200 or 201, or MCB 200 or equivalent course.
- 583 (3) Wood Physics and Mechanics – Wood-water interactions: thermal and electrical properties and heat transfer in wood; stress-strain relationships; fracture mechanisms (static and dynamic); the influence of material variability, changing resource characteristics, temperature, time and moisture content on mechanical properties and structural use of wood. [3-0]
- 584 (3) Wood and Pulp Science Seminar – Presentation and critical review of topics and problems relating to wood properties and manufacturing processes. [2-0; 2-0]
- 585 (4) Research Methods in Forest Hydrology – Methodology and technique of studying the terrestrial components of the hydrologic cycle, in relation to forest hydrology.
- 586 (3) Wood Products Processing – Mechanical processing principles applicable to the conversion of logs to forest products including: lumber processing and control systems, wood composite classification and manufacturing concepts, preservation processing technology and fiber to pulp conversion.
- 587 (2) Wood Composites – Relationship of bulk and surface properties of wood to composite formation; influence of adhesive chemical and physical properties on bond performance. Processing strategies to enhance strength and durability of wood composites. Prerequisite: WOOD 487.
- 589 (2-6) c Problems in Forest Watershed Management
- 591 (2-6) c Research Methods in Forest and Wildland Recreation
- 593 (2-6) c Problems in Forest and Wildland Recreation – Analysis of and solutions to problems in administration and management of recreation resources in forests, wildlands and non-urban parks.
- 594 (3) Landscape Ecology and Management – Ecological aspects of the development, form, and function of landscapes.
- 595 (2-6) c Research Methods in Forest Wildlife Studies
- 597 (2-6) c Problems in Forest Wildlife Management
- 599 (6/12/18 c M.A.Sc. Thesis
- 649 Ph.D. Thesis
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- Natural Resources Conservation CONS**
- 200 (3) Foundations of Conservation and Natural Areas Management – Concepts of conservation and wilderness preservation. Principles of natural area management for biological diversity, habitat conservation and recreation. [2-2; 0-0]
- 320 (3) Natural Resource Communications – Concepts and techniques for communication with various constituencies in the natural resources arena. Principles of public relations, conflict resolutions and public participation in resource planning and decision making. Business and professional speaking. [2-2; 0-0]
- 330 (3) Introduction to Conservation Biology – Overview of approaches to the maintenance of biodiversity. Review of contributions of different disciplines to conservation biology. [0-0; 2-2]
- 430 (3) Management of Problem Wildlife – Principles of managing problem wildlife in forest and agricultural environments. Habitat manipulation and design, resiliency of populations, principles of integrated management, ecological control methodology. Class field trips to study problems in development of effective integrated management of problem wildlife. Prerequisite: FRST 395, CONS 330, or equivalent course in animal ecology. [2-2; 0-0]
- 440 (3) Recreation and Conservation Policy – Policy formulation and analysis for recreation and conservation. The roots of policy in utilitarian conservation, romantic preservation and attitudes towards nature. Institutional origins in forest service and parks services. Emergence of wilderness policy and its expansion. Recent policy developments in British Columbia and Canada. [3-0; 0-0]
- 481 (3) Protective Areas Planning – Tools and techniques used to develop resource conservation plans, interpretive service plans and recreation development plans for protected areas. [2-2; 0-0]
- 491 (2) Issues in Recreation, Natural Areas Management and Resource Conservation – A seminar on issues in resource-based recreation and related tourism, wildlife and natural heritage conservation in the governance of lands and coastal resources; analysis of recreation and related tourism, wildlife and natural heritage policies; the application of research findings to natural heritage including wildlife conservation and recreational land management. Prerequisite: FRST 290 or CONS 200. [0-0; 2-0]
- 498 (4) Thesis or Special Project – An independent study or research project of a subject of special interest to the student under the supervision of a staff member. The subject must be appropriate to the student's area of concentration.
- 500 (4) Seminar in Biological Conservation – Topics in conservation biology with application to current issues and particular reference to (but not limited to) forested ecosystems. [2-1; 2-1]
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- Wood Science and Industry WOOD**
- 110 (2) Introduction to Wood Science. – An introduction to the anatomical, physical, chemical, mechanical and biological properties of wood. (2-1; 0-0)
- 120 (3) Introduction to Wood Products Industry. – Introduction to forestry, wood products industry, processes, products, markets and forest policy issues affecting the wood industry. (0-0; 2-3)
- 241 (3) Problem Solving. – A practical introduction to business communication, computer and problem solving skills. Students will exercise these skills using problem cases taken from industrial applications. Prerequisite: MATH 100. (3-3; 0-0)
- 242 (3) Introduction to Business Statistics and Quality Control. – A practical introduction to the use of statistics and quality control to solve problems in the wood products industry. Students will exercise skills using problem cases taken from industrial applications. Prerequisite: WOOD 241. (0-0; 3-3)
- 271 (3) Wood Products Chemistry I. – Introduction to chemistry relating to wood and wood products. Chemistry of lignin, cellulose, hemicelluloses, extractives, biological conversion and treatment of lignocelluloses. Prerequisite: CHEM 103 or 110 or 122 or 151. (2-3; 0-0)
- 272 (3) Wood Products Chemistry II. – Chemical aspects of wood treatment with emphasis on gluing and preservation of wood. Testing methods for strength, durability and performance. Prerequisite: WOOD 271. (0-0; 2-3)
- 280 (3) Wood Anatomy and Identification. – Introduction to tree growth: macroscopic and microscopic anatomy and identification of softwoods and hardwoods; descriptions of cell wall ultra-structure, wood variability and wood quality. [3-3; 0-0]
- 282 (3) Wood-Fluid Treatments. – An introduction to wood-moisture relationships, transport phenomena, acoustical and electrical properties of wood, wood drying methods and wood pressure impregnation procedures. (0-0; 3-2)
- 300 (0) Cooperative Work Placement I – Supervised work experience in an approved organization for a minimum of four months during the first term, third year of the Wood Science and Industry Cooperative Education Program.
- 310 (0) Cooperative Work Placement II – Supervised work experience in an approved organization for a minimum of three months during the summer term between the third and fourth years of the Wood Science and Industry Cooperative Education Program.
- 335 (3) Quality Improvement – Modern techniques for improving quality in the workplace with particular emphasis on the forest products industry. Topics include quality control management, control charting, continuous improvement and analysis of variance techniques. Prerequisites: FRST 231 or equivalent. [0-0; 3-1]
- 353 (2) Mill Site Visits – One week of on-site study of forest products manufacturing plants immediately following Spring examinations of Second or Third Year. Representative sawmills, plywood mills, remanufacturing plants, particleboard manufacturers, pulp mills, laminated timber plants and wood preservation facilities in the Interior are studied. Fees will be assessed to meet expenses. (See index - Fees "Special Fees")
- 371 (3) Wood Deterioration and Protection – Destructive effects of fungi, insects, marine borers, fire, and weathering on wood products in service. Prevention and control through sanitation, proper utilization and construction practices and preservative treatments. Decay and pathogens in living trees and consequences for utilization. Prerequisites: WOOD 280 and 372. [0-0; 3-2]
- 372 (3) Wood Physics – Properties related to anatomy, variability in behaviour, processing and use of wood and pulp: wood-moisture relations growth characteristics; anisotropy; thermal, electrical and acoustical properties; application of these principles to practical situations. Prerequisite: WOOD 280. [0-0; 2-2]
- 374 (3) Manufacture and Properties of Wood Products – An overview of the conversion of wood and manufacture into major products by various mechanical, chemical and reconstitution processes. Mechanical, chemical and physical properties of composites; formation of wood pulp; preservative treatment and drying of wood products. [3-4; 0-0]
- 376 (3) Mechanics of Wood Products – Introduction to the strength of materials with emphasis on the elastic properties and ultimate strength of wood and wood products. Prerequisite: PHYS 101 or 170. [0-0; 2-2]
- 377 (3) Microscopic Analysis of Wood – Histological methods; light and electron microscopic techniques for wood observation. Prerequisite: WOOD 280. [0-0; 1-4]
- 400 (0) Cooperative Work Placement III – Supervised work experience in an approved organization for a minimum of

- four months during the second term, fourth year of the Wood Science and Industry Cooperative Education Program.
- 448 (3) Summer Work Report – Technical report on relevant wood industry experience. Faculty advice during the summer and preparation of the report required for style and contents.
- 461 (3) Wood Products Marketing – Industry structure, competitive environment and strategic options of major segments of the North American wood products industry; examination of major North American companies. Prerequisite: ECON 100. [3-2; 0-0]
- 470 (3) Commercial Timbers of the World – Systematic study of commercial tree species, their identification, wood structure, properties and utilization. Survey of Europe, Latin America, Africa, Asia, and Oceania by plant families. Prerequisites: WOOD 280 or 475. Not offered in 1993/94. [0-0; 2-2]
- 473 (4) Wood Chemistry and Chemical Utilization – Wood chemical composition; cellulose, hemicelluloses, lignins and extractive structures, reactions and responses in wood, pulp, and derivatives processing, wood as energy source. Prerequisite: CHEM 253 or 230. [0-0; 3-4]
- 475 (3) Wood Properties, Identification and Uses – Elementary chemical, physical and mechanical properties of wood and their variations in relation to structure; identification by hand lens features; manufacture of lumber, pulp and composite wood products. (Not available for credit to Wood Science and Industry students.) Prerequisite: FRST 111. [3-2; 0-0]
- 476 (5) Timber Structures and Design – Design of engineered structural elements using limit states and working stress design principles with emphasis on wood, load duration, stress grades, sawn and glued laminated members, deflection, elastic instability, combined loads, timber joints, fasteners and light-frame systems. Prerequisites: WOOD 376 or CIVL 230. [2-2; 0-0]
- 482 (2) Wood Drying and Finishing – Principles and methods of seasoning of forest products; principles of finishing wood. Prerequisite: WOOD 372. [0-0; 2-2]
- 484 (3) Sawmilling Systems – Principles for the design and operation of sawmills from the log sorting yard to the green lumber stage. Emphasis on designing and coordinating sawmill machine centers in the context of marketing requirements and raw material availability. Introduction to sawing optimization systems and process control. Prerequisite: FRST 332. [2-3; 0-0]
- 487 (3) Glued Wood Products – Physical, chemical and mechanical variables involved in cold, hot and non-conventional adhesive bonding of wood; preparation and characteristics of adhesives; plywood, composite wood panels, hardboard, medium density fibreboard and laminated wood manufacturing processes; important physical and chemical properties of products; methods of prefinishing. Prerequisites: WOOD 280 and 372. [0-0; 2-3]
- 488 (3) Analysis of Sawmill Operations – Principles of log and lumber grading and measurement. Introduction to methods for: estimating production rates and yield of lumber and residue; cost accounting investment analysis; marginal log analysis; micro-computer applications of sawmill simulators and other analytical software. Corequisites: FRST 332 and 333. Not offered in 1993/94. [2-2; 0-0]
- 110 (6) First-Year French Prerequisite: FREN 11 or FREN 105. Not available for credit to students with French 12 or FREN 100. [3-1; 3-1]
- 121 (3) Contemporary French Language – Preparation for first-year university French, for students with Grade 12 who are not at the level required for FREN 122. Prerequisite: French 12 and assessment based on departmental placement test. [3-1]
- 122 (3) Contemporary French Language and Literature I Prerequisite: French 12, FREN 100 or 110, and placement test, or FREN 121. [3-1]
- 123 (3) Contemporary French Language and Literature II Prerequisite: FREN 122 or assignment based on placement test. [3-1]
- 215 (6) Oral French Practice – Course designed to provide opportunities for students already well-grounded in grammar to improve their oral skills. Prerequisite: FREN 123. [3-1; 3-1]
- 220 (6) An Introduction to Literature Written in French and to Textual Analysis. – To be taken by all students intending to proceed to the Major or Honours program. Prerequisite: FREN 123. [3-0; 3-0]
- 222 (3) Studies in French Language and Style I – Grammar, vocabulary, composition, language in context. To be taken by all students intending to proceed to the Major or Honours program. Prerequisite: FREN 123 or assignment based on placement test. [3-1]
- 223 (3) Studies in French Language and Style II – Grammar, vocabulary, composition, language in context. To be taken by all students intending to proceed to the Major or Honours program. Prerequisite: FREN 222 or assignment based on placement test. [3-1]
- 300 (3/6) d Methods of Literary Analysis – A systematic inquiry into problems and methods of literary criticism. Emphasis on the application of various analytical techniques to texts chosen from different genres. Six credits required for third-year Honours students specializing in literature; open to all students with FREN 220. [3-0] or [3-0; 3-0]
- 320 (3) French Literature from the Middle Ages to 1700 in its Historical and Cultural Context. Prerequisite: FREN 220. [3-0]
- 321 (3) French Literature from 1700 to the Present in its Historical and Cultural Context. Prerequisite: FREN 220. [3-0]
- 330 (3/6) d French-Canadian Literature – Characteristic works, from its origins to the present. Prerequisite: FREN 220. [3-0; 3-0]
- 334 (6) French Civilization – A thematic approach to French literary works considered in a broad cultural context. Prerequisite: FREN 220 or FREN 223 or permission of the Department. [3-0; 3-0]
- 335 (6) French-Canadian Civilization – A thematic approach to French-Canadian literary works considered in a broad cultural context. Prerequisite: FREN 220 or FREN 223 or permission of the Department. [3-0; 3-0]
- 340 (6) French for Reading Knowledge, I – This course provides students having little or no previous language instruction in French with a basic knowledge of French grammar and vocabulary sufficient for the understanding of scientific and scholarly works. Classwork and outside assignments consist mainly of oral and written translation into English of texts from the humanities, the social sciences, and the natural sciences. Intended primarily as a service course for university departments requiring a reading examination in their advanced programs, this course is not available for credit toward a Major or Honours program in French and does not satisfy the language requirement of the Faculty of Arts. Not available for credit to students with French 12, FREN 100, FREN 110, or equivalent. [3-0; 3-0]
- 341 (6) French for Reading Knowledge, II – This course provides students having some basic knowledge of French with a review of French grammar and vocabulary, to improve their ability to understand scientific and scholarly works. Classwork and outside assignments consist mainly of oral and written translation into English of texts from the humanities, the social sciences, and the natural sciences. Intended primarily as a service course for university departments requiring a reading examination in their advanced programs, this course is not available for credit toward a Major or Honours program in French. Available to students with French 12, FREN 100, FREN 110, FREN 123 or equivalent. [3-0; 3-0]
- 342 (6) French Practice for Non-Specialists – French grammar, oral expression, reading skills, and short written compositions. Not available for credit toward a Major in the Department of French. Prerequisite: FREN 123 and at least third-year standing. Credit will not be granted for both FREN 223 and 342. [3-1; 3-1]
- 344 (6) Techniques of Oral Expression in French – Intensive workshop designed to strengthen skills in formal oral presentation in French, emphasis on structured expression as well as effective oral delivery. Prerequisite: second-year French course (second-class standing or better recommended in FREN 215). [3-1; 3-1]
- 346 (3) Business French – The essential vocabulary and style of French commercial correspondence and business texts. Not available for credit toward a Major or Honours program in French. Prerequisite: FREN 123 or equivalent. [3-0]
- 351 (3) Corrective French Phonetics – Theory and practice of French pronunciation, corrective phonetics; foundation for the phonetic transcription of international French. Prerequisite: FREN 220 or 223. [2-2]
- 353 (3) French Grammar – Systematic study of the fundamental principles of French grammar. Prerequisite: FREN 223 or equivalent. [3-0]
- 355 (3) French Composition I – Development of essay writing skills in French. Prerequisite: FREN 223 or equivalent. [3-0]
- 357 (3) Translation I – Comparative study of French and English through translation. Prerequisite: FREN 223 or equivalent. [3-0]
- 370 (3) Introduction to French Linguistics – A survey of basic terminology, methods, problems, and theoretical trends in French Linguistics, specifically designed to provide students with a foundation for advanced language study in the Department of French. Prerequisite: FREN 223. [3-0]
- 400 (6) A Survey of French Literature in Translation Prerequisite: Six credits of first-year English or Arts One and at least second-year standing. Not available for credit toward a Major or Honours program in French. [3-0; 3-0]
- 401 (6) Fourth-Year Honours Seminar – To be taken in the Fourth Year by all Honours students specializing in literature. Prerequisite: FREN 300 or permission of the Department. [2-0; 2-0]
- 402 (3/6) d An Introduction to French Poststructuralist Thought (in English) – Key texts by writers such as Foucault, Derrida, Lacan, Kristeva, Cixous and Irigaray will be read in translation, with assignments and discussion in English. Open to all students in third year and up. Not available for credit toward a Major or Honours program in French. [3-0] or [3-0; 3-0]
- 403 (6) Survey of French-Canadian Literature in Translation Prerequisite: Six credits of first-year English or Arts One and at least second-year standing. Not available for credit toward a Major or Honours program in French. [3-0; 3-0]
- 407 (3/6) d Medieval French Literature – Representative literary texts from the eleventh to the fifteenth century. Topics and authors may include the epic, Tristan texts, Arthurian texts, the short narrative, satirical texts, religious drama, secular drama, lyric poetry, didactic poetry, François Villon. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]

**French
Faculty of Arts**
FREN

- 100 (12) Beginning French—Intensive Course – Grammar, composition, reading, and oral practice. Not available to students with prerequisite for FREN 110. [5-2; 5-2]
- 105 (6) Beginning French – Grammar, composition, reading, and oral practice. Not available to students with prerequisite for FREN 110. [3-1; 3-1]

- 408 (3/6) d Literature of the Sixteenth Century – Topics may include works by Rabelais, Montaigne, Scève, Labé, Ronsard, and Du Bellay. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 409 (3/6) d Literature of the Seventeenth Century – Representative authors. Topics may include works by Corneille, Racine, Molière, Descartes, Pascal, La Fontaine, and Mme de la Fayette. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 410 (3/6) d Literature of the Eighteenth Century – The drama, the novel and representative writings of Voltaire, Diderot, and Rousseau. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 411 (3/6) d Poetry and Drama of the Nineteenth Century – Representative works and significant trends. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 412 (3/6) d The Nineteenth-Century Novel – Significant historical, social and cultural trends. Representative authors may include Stendhal, Balzac, Flaubert, and Zola. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 414 (3/6) d Twentieth-Century Drama – The themes and codes of francophone drama. Topics may include the theatre of the absurd, the theatre of alienation, and the nature of the theatrical illusion. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 415 (3/6) d The Twentieth-Century Novel – The aesthetics of the novel and the development of narrative techniques; the historical background of the period and the writing of themes such as alienation, authenticity, commitment, representation of sexuality, and textual self-reflexivity. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 417 (3/6) d Twentieth-Century French Poetry – Representative works and significant trends. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 418 (3/6) d African and Caribbean Literature in French – An introduction to representative works. Topics include Négritude, the evolution of post-colonial literature, and the socio-historical context of each work. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 419 (3/6) d Francophone Women Writers. – Representative French women writers from the Middle Ages to the present; contemporary women writers in French Canada. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 420 (3-6) c French Literature – Selected topics. Prerequisite: FREN 220.
- 422 (3-6) d Francophone Women Writers in Translation – Selected texts by French and francophone Canadian/Québécois women writers. Taught in English, using texts in translation. Assignments in English. Not available toward a Major or Honours program in French. Students may not receive credit for both FREN 419 [3-0] or [3-0; 3-0]
- 425 (3/6) d Children's Literature of the French-Speaking World – Topics may include discussion of fairy tales, legends, moral tales, adventure stories, picture books and comics, from socio-political, psychological and aesthetic perspectives; production and reception throughout the centuries; special attention to the contemporary corpus. Prerequisite: FREN 220. [3-0] or [3-0; 3-0]
- 426 (3) Staging Theatre in French – The study and production of a play in French. All students will be expected to be involved in some aspect of the production, and to complete written assignments on the play and/or the author. Prerequisite: FREN 220; FREN 300 highly recommended. [3-0]
- 430 (3/6) d French-Canadian Literature – Selected topics. Prerequisite: at least 3 credits of FREN 330 or FREN 335. [3-0] or [3-0; 3-0]
- 440 (3) Computer Applications for French – This course is an introduction to the use of computers in French language and literature studies, and to the immediate practical and theoretical implications of computational approaches. No experience with computers is required. [3-0]
- 441 (3) Computer Applications for French, II – This course is offered to students who would like to apply computational techniques to their own literary or linguistic research project. The course will develop both the methodological and the theoretical implications of the computational approach in the context of the student's projects. Possible projects include literary textbase design, automatic thematic tagging, automatic writing, and computer-assisted quantitative linguistics. Prerequisite: FREN 440. [3-0]
- 453 (3) French Stylistics Prerequisite: FREN 353 or 355 or 357. [3-0]
- 455 (3) French Composition II – Workshop in creative writing, fiction and non-fiction. Prerequisite: FREN 355. [3-0]
- 457 (3) Translation II – Advanced translation. Prerequisite: FREN 357. [3-0]
- 461 (3) Historical Phonetics and Phonology of French – Phonetic evolution from Latin to modern French. Emphasis on the Latin of northern Gaul and the origins of the phonology of modern French. Prerequisite: FREN 351 and 370. [3-0]
- 462 (3) Historical Morphology and Syntax of French – Development of grammatical forms from Latin, through medieval French, to the modern language. Prerequisite: FREN 370. [3-0]
- 464 (3) Historical Lexicology of French – Popular vocabulary, loan-words; relationships between lexicon and cultural history; the stages in the assimilation of neologisms; changes in meaning. Prerequisite: FREN 370. [3-0]
- 465 (3) Introduction to Old French – An introduction to the phonetics, grammar and vocabulary of major Old French dialects; corpus of various literary texts (9th - 14th c.). Prerequisite: FREN 353. [3-0]
- 470 (3-6) c French Language – Selected topics. Prerequisite: at least FREN 223, but there may be others depending on the topic selected.
- 471 (3) Advanced French Phonetics – Descriptive phonetics; advanced features in phonetic script and intonation, sociolinguistic and regional variation, presentation of computer-assisted speech analysis. Prerequisite: FREN 351. [3-0]
- 472 (3/6) d Morphology of the French Language – The morphological markings of French (gender, number, tense, mode, person, etc.) and their underlying semantic systems. Prerequisites: FREN 353 and 370 (FREN 353 and 370 may be taken concurrently with the permission of the instructor). [3-0] or [3-0; 3-0]
- 473 (3/6) d Syntactic Description of the French Language – The syntactic markings of French (word order, agreement, pronominalisation, etc.) and their underlying semantic systems. Prerequisites: FREN 353 and 370 (FREN 353 and 370 may be taken concurrently with the permission of the instructor). [3-0] or [3-0; 3-0]
- 474 (3) Synchronic Lexicology – An introduction to the study of the vocabulary of modern French, focusing on basic principles in lexical semantics, lexicology, phraseology, lexicography, terminology and new technologies, neology. Prerequisites: FREN 353 and 370. [3-0]
- 475 (3/6) d Canadian French: A Descriptive Approach – The phonetics, phonology, lexicon and syntax of spoken and written Canadian French. Prerequisites: FREN 351, 353 and 370. (FREN 351 may be taken concurrently with the permission of the instructor.) [3-0] or [3-0; 3-0]
- 476 (3) The Pronominal Approach and the Description of Spoken French. – A formal analysis of syntactic structures based on examples of spoken French. Prerequisite: FREN 353 and 370 (FREN 353 and 370 may be taken concurrently with the permission of the instructor). [3-0]
- 478 (6) 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. Prerequisite: two years' study of each of two Romance languages or two years of one Romance language and one year of Latin. (Also listed as LING 320 and RMST 478.) [3-0; 3-0]
- 480 (3/6) d Comparative French and English Stylistics – Detailed comparative study of characteristic French and English forms of expression. Available only to students enrolled in the Diploma program in Translation. [3-0; 3-0]
- 482 (3/6) d Advanced Translation: French to English – This course is intended to give a wide-ranging and thorough foundation in both literary and technical translation from French to English. Must be taken concurrently with FREN 484. Available only to students enrolled in the Diploma program in Translation. [3-0; 3-0]
- 484 (3/6) d Advanced Translation: English to French – This course is intended to give a wide-ranging and thorough foundation in both literary and technical translation from English to French. Must be taken concurrently with FREN 482. Available only to students enrolled in the Diploma program in Translation. [3-0; 3-0]
- 486 (3/6) d Seminar in Advanced Translation – Available only to students enrolled in the Diploma program in Translation. [3-0; 3-0]
- 489 (6) Translation Project – A major practical exercise in translation: French to English or English to French. Available only to students enrolled in the Diploma program in Translation.
- 499 (6-12) c Honours Essay
- 500 (3) Methods of Bibliography and Research
- 501 (3/6) c Studies in the Literature of Medieval France
- 502 (3/6) c Studies in Sixteenth-Century Literature
- 503 (3/6) d Studies in Seventeenth-Century Literature
- 504 (3/6) d Studies in the Seventeenth-Century Novel
- 505 (3/6) d Studies in Seventeenth-Century Drama
- 506 (3/6) d Studies in the Eighteenth-Century Novel
- 507 (3/6) c Studies in the French Enlightenment
- 508 (3/6) d Studies in French Romantic Literature
- 509 (3/6) d Studies in Post-Romantic Nineteenth-Century Literature.
- 510 (3/6) d Baudelaire and the Symbolists
- 511 (3/6) d Studies in Contemporary French Literature
- 512 (3/6) d Studies in Literary Criticism
- 513 (3/6) d Studies in French-Canadian Literature
- 514 (3/6) d Problems Relating to the French Novel
- 519 (3/6) c The Language and Literature of Old Provençal
- 520 (3-12) d Studies in French Literature
- 521 (3/6) d Studies in the Literature of the French-Speaking World.
- 540 (3/6) d Studies in French and Comparative Stylistics
- 548 (0) Major Essay
- 556 (3-12) d Studies in French Language
- 560 (3/6) d Studies in French Phonetics and Phonology
- 561 (3/6) d Studies in French Morphology
- 562 (3/6) d Studies in French Syntax
- 564 (3/6) d Studies in French Lexicology
- 566 (3/6) d Studies in French Semantics
- 575 (3/6) d Studies in Canadian French
- 576 (3/6) d Studies in Gallo-Romance Dialectology
- 578 (3/6) d Studies in Romance Philology
- 599 (6) Master's Thesis
- 699 Ph.D. Thesis

Genetics **GENE**
FACULTY OF GRADUATE STUDIES. SEE ALSO
COURSE LISTED UNDER MEDICAL GENETICS.

- 501 (3) Genetics – A lecture series intended to acquaint graduate genetics students and those in related areas with

advances in genetics and an overview of genetics in a variety of systems. The emphasis is on molecular genetics. Required of students in the graduate genetics program. Prerequisites: BIOL 334 and 335 or equivalent and a third year course in Biochemistry.

- 502 (3) Genetics – A lecture series intended to acquaint graduate genetics students and those in related areas with advances in genetics and an overview of genetics in a variety of systems. The emphasis is on eukaryotic genetics. Required of students in the graduate genetic program. Prerequisites: BIOC 334 and 335 or equivalent and a third year course in Biochemistry.
- 549 (6/12) c M.Sc. Thesis
- 649 Ph.D Thesis

Geography FACULTY OF ARTS

GEOG

Students registered in the B.Sc. program in Geography may receive Arts credit for no more than two of the following courses: GEOG 260, 290 (formerly 190), 321, 327, 328, 329, 350, 360, 362 and 363. These are the only Geography courses that will be considered as Arts electives for the B.Sc. degree in Geography.

The following Geography courses may not be used for either Arts or Science designated credit: GEOG 212, 310, 315, 316, 317, 370, 371, 374, 375, 410, 415, 417, 418, 445. *Courses which have Science credit are followed by an asterisk.

- 101* (6) Introduction to Physical Geography – Introduction to the physical environment: basic physical principles of climate, hydrology, geomorphology and biogeography, including human-induced changes: global and regional patterns of natural phenomena. Lab exercises cover measurement techniques, data analysis, and map and air photo analysis. (Same as GEOG 102 plus GEO 103.) [3-2; 3-2]
- 102* (3) Introduction to Climate and Biogeography – Basic physical principles and processes governing atmospheric circulation, climate and the water cycle. Natural and human-induced environmental change. Laboratory covers techniques of representation and analysis, including map construction and analysis. Credit for only one of GEOG 101 and 102. [3-2; 0-0]
- 103* (3) Introduction to Terrestrial Physical Geography – Physical processes of landform evolution; hydrologic, biogeochemical and denudation cycles; human-induced changes in natural systems. Lab exercises cover measurement techniques, data analysis, and map and air analysis. Credit for only one of GEOG 101 and 103. [0-0; 3-2]
- 121 (3) Geographical Change in the Modernizing World I – An introduction to the human geography of the modernizing world, c. 1450 - 1945, including: power, space and the geography of agrarian societies; the formation of a European world system; geographies of industrialization, urbanization and geopolitics of wars and revolutions. [3-1; 0-0]
- 122 (3) Geographical Change in the Modernizing World II – The human geography of the modern world since 1945: global interdependence in economic geography, geopolitics, and cultural geography; consequences of modernization, including demography, urbanization and environmental effects; regional case studies; reactions to modernization. Continuation of GEOG 121, but may be taken separately. [0-0; 3-1]
- 200* (3) Macroscale Weather and Climate – An introduction to the principles of meteorology and climatology at the synoptic and global scales. Atmospheric energy, moisture and motion. Weather systems, forecasting and global climates. Prerequisites: GEOG 101 or 102 or the first year of a B.Sc. program (same as ATSC 200). [3-2; 0-0]
- 204* (3) Forest and Agricultural Climatology – Basic principles and processes of climatology. Energy and water balance concepts. Weather systems and climate change, microclimate of soils, crops, forests and animals. Credit for only one of GEOG/SOIL 204 or ATSC/GEOG 300. (Same as SOIL 204). [3-2; 0-0]
- 205* (3) Introduction to Hydrology – Principles of hydrology at site, watershed, and larger regional scales. Introduction to techniques of measurement and analysis. Emphasizes surface water hydrology of western North America. Prerequisite: GEOG 101 or 102, GEOG 200 recommended. [0-0; 3-2]
- 207* (3) Geography of Ecosystems – Landscape ecology, emphasizing the vegetation component of ecosystems; their spatial distributions and interactions; the effects of disturbance and management. Data sources, including historical records. Regional examples will be emphasized. Prerequisite: GEOG 101, or 102 and 103. [3-2]
- 210 (3) Vancouver and Its Region. – An integrated approach to the physical and human geography of the Lower Mainland of British Columbia. Field trips. [3-1; 0-0] or [0-0; 3-1]
- 290 (3) Introduction to the Geography of Canada – Selected topics in human geography focusing on the regional distribution of natural resources, population, urban systems, and economic activities. [3-1; 0-0]
- 300* (3) Microscale Weather and Climate – Meteorology and climatology at the micro-, local, and meso-scales. Transfers and balances of heat, mass and momentum. Microclimates on scales of a leaf to those of a large valley. Credit for only one of ATSC 300, GEOG 204, 300 or SOIL 204. Prerequisites: ATSC 200 or GEOG 200. (Same as ATSC 300.) [0-0; 3-0]
- 301* (3) Atmospheric Energetics – Atmospheric thermodynamics and radiative transfer. Enthalpy and entropy; static stability, mixing and thermodynamic diagrams; absorption and transmission of long and shortwave radiation. Prerequisite: One of PHYS 156, 203, 213. (Same as ATSC 301.) [3-0; 0-0]
- 302* (3) Atmospheric Phenomena – Physical basis of cloud, precipitation, and other atmospheric phenomena. Cloud dynamics and microphysics; aerosol, droplet, ice particle growth and cloud electrification; global entropy budgets; radar meteorology. Prerequisite: ATSC/GEOG 301. (Same as ATSC 302.) [0-0; 3-0]
- 303* (3) Methods in Atmospheric Science – An introduction to instrumentation used in monitoring the state of the atmosphere; a brief survey of methods of analysis of meteorological data. Prerequisite: ATSC/GEOG 200, CPSC 111. (Same as ATSC 303.) [0-0; 2-2]
- 306* (3) Principles of Geomorphology – Processes and principles of landform development; morphological and historical analysis of landforms at various space and time scales; applications in engineering and resource development. (Same as GEOL 351.) Prerequisite: GEOG 101 or 103 or GEOL 100. Credit will be given for only one of GEOG 306, GEOL 351 and its predecessor GEOG 251. [3-2; 0-0]
- 308* (3) Quaternary and Applied Geomorphology – Quaternary landscape development emphasizing the history of glaciation with special reference to western North America; applications of geomorphology in resource development and land management; interpretation of quaternary materials. Weekend field trips required. Prerequisite: SOIL 200, GEOG 306, or GEOL 351. [0-0; 3-2]
- 309* (3) Physical Geography Field Course – Field sampling, instrumentation, surveying and mapping techniques; data analysis and report writing; 1 lecture per week during term and 2 weeks at field camp in late April; special fees required; enrolment limited. Students will be responsible for transportation to and from the field camp and for liability insurance. Prerequisites: GEOG 200 (or 204) and 205. [0-0; 0-3]
- 310 (3) Environment and Resources – Concepts of environment and resource; the role of physical geography in understanding the interaction of humans and the environment; introduction to the management of environment-resource systems. Prerequisite: six credits from GEOG 101, 102 (or 200 or 204), 103, 205, 207. [3-0; 0-0] or [0-0; 3-0]
- 315 (3) Environmental Inventory and Classification – Classification and inventory of those biophysical elements which influence people's use of air, land, and water. Prerequisite: Six credits from GEOG 101, 102, 103, 200 or 204, 205 and 207. [1.5-1.5]
- 316 (3) Geography of Natural Hazards – The role of geophysical events, human ecology, environmental perception, world social and political order in explaining the risk of natural disasters. Assessment of acceptable risk, disaster relief and reconstruction and contrasts between developed and developing nations. Prerequisite: GEOG 101 or GEOG 102 and 103. [3-0]
- 317 (3) The Physical Environment of British Columbia – The biophysical processes which are shaping and have shaped British Columbia; characteristic associations between landforms, climate, soil, and vegetation; biophysical constraints on air, land and water use. Prerequisite: Six credits from GEOG 102 (or 200 or 204), 101, 103, 205, and 207. [0-0; 3-0]
- 318 (3) Environmental Change and Quality. – The physical and human causes of environmental change at various temporal and spatial scales. The impact of such change on the interpretation and measurement of environment quality. (Will alternate with GEOG 319). Prerequisite: GEOG 310. [3-0; 0-0]
- 319 (3) Environmental Impact Assessment. – The role of environmental impact assessment within the context of environmental management. Institutional arrangements for EIA in Canada and BC will be examined through the use of evaluative criteria and critical case studies. (Will alternate with GEOG 318). Prerequisite: GEOG 310. [3-0]
- 321 (3) Historical Geography of Urbanization – Geographic perspectives on the growth of urban regions; pre-industrial cities, urban growth during industrialization, anti-urban reaction. Prerequisite: GEOG 121 or the former 260. [3-0; 0-0] or [0-0; 3-0]
- 327 (3) Historical Geography of Canada, I: Canada Before 1850 – Canada from the beginning of European contact to the mid 19th century, stressing the changing geographical patterns of settlement, economy, and culture. [3-0; 0-0]
- 328 (3) Historical Geography of Canada, II: Canada After 1850 – The spread of settlement, the growth of towns, and the development of economic and cultural regions in a Canada increasingly influenced by industrialization. [0-0; 3-0]
- 329 (3) Introduction to Political Geography – The heritage of political geography; the spatial structure of political organization including regional and global structures. Prerequisite: GEOG 121 or 122 or the former 260; also open without this prerequisite to Major and Honours students in History, International Relations, and Political Science. [0-0; 3-0]
- 345 (3) Geographic Thought and Practice – Major intellectual traditions of human and physical geography. Geographers and geography in society. [3-0; 0-0]
- 350 (3) Introduction to Urban Geography – City systems and theories of urban location; internal spatial structure of the city; commercial and industrial location; social areas; neighbourhood and land use change; urban trends and public policy. Prerequisite: GEOG 121 or 122 or the former 260 or URST 200. [3-0; 0-0] or [0-0; 3-0]
- 352 (3) The Geography of Third World Urbanization – Urbanization in the developing countries of Latin America, Africa, and Asia; the role of cities in the development process and the features and problems of rapid urbanization. [3-0; 0-0]
- 357 (3) Introduction to Social and Behavioural Geography – The development of social and behavioural geography; focus on such topics as environmental perception and microgeography, approached from institutional and interactionist perspectives. Prerequisite: GEOG 121 or 122. [0-0; 3-0]

- 360 (3) Geography of Retail, Wholesale, and Service Activities – Contemporary patterns of economic activity. The geographical and policy factors which shape them. Introduction to spatial analysis of consumer demand and industrial organization and policy. Focus on such topics as the location of shopping centres and office complexes. Prerequisite: GEOG 122 or the former GEOG 260. [3-0; 0-0]
- 361 (3) Introduction to Economic Geography. – History and methods of economic geography. Location of resource industries, manufacturing, and service activities with emphasis on British Columbia in its North American and world setting. Recommended for students with no previous exposure to Economic Geography, before taking other courses in the 36x and 46x series. Prerequisite: GEOG 122. [3-1; 0-0] or [0-0; 3-1]
- 362 (3) Geography of Economic Development – Geographical approaches to economic development; models of economic development and spatial change; influences on spatial economic change; case studies from the developed, third, and socialist worlds. Prerequisite: GEOG 122 or the former 260. [0-0; 2-1]
- 363 (3) The Geography of Resource Industries – Geographical analysis of selected resource industries of importance to Canada. Each year a selection will be made from the agriculture, forestry, fishing, mining, energy, and recreation sectors which will be dealt with in international and national contexts. Prerequisite: GEOG 122 or the former 260. [3-0; 0-0]
- 370 (3) Introduction to Geographic Information and Its Analysis. – Introduction to Geographic Information Systems and to computer-based graphical methods of data analysis. Emphasis on data visualization techniques such as cartographic modelling and exploratory data analysis. Priority enrollment for Major and Honours students in Geography. [2-2; 0-0] or [0-0; 2-2]
- 371 (3) Research Strategies in Human Geography. – Formulating a research problem and selecting an appropriate research strategy. Research strategies range from social scientific survey methods to ethnography. Priority enrollment for Honours and Major students in Geography. [0-0; 3-0]
- 372* (3) Cartography – Cartographic methods: development of cartography; projections; data ordering, compilation and symbolization; cartographic design, map reproduction. Prerequisite: six credits from GEOG 101, 102, 103, 200 or 204, 205 and 207. [2-2; 0-0] or [0-0; 2-2]
- 373* (3) Introductory Remote Sensing – Aerial photography; measurement from aerial photographs; photo-interpretation in geographic analysis; remote sensing of the earth's surface and atmosphere. [2-2; 0-0]
- 374 (3) Statistics in Geography I – Introduction to statistical techniques and their application to geographical problems. Priority enrollment for Honours and Major students in Geography. [3-0; 0-0]
- 375 (3) Spatial Data Analysis – Introduction to computer programming and statistical techniques for managing, analyzing, and mapping spatial data: survey of topics complemented by assignments using package computer programs and geographical information systems. Prerequisite: GEOG 370. [0-0; 2-2]
- 379 (3) Field Course in Human Geography – As announced by the department a year in advance. Prerequisite: the relevant core course or courses.
- 380 (3) Introduction to the Geography of Monsoon Asia – A comparative regional analysis stressing the historical development and changing cultural, economic, and political patterns of the area. Special reference to India, Indonesia, China, and Japan. [3-0]
- 390 (3/6) d Geography of Selected Regions – A geographical analysis of selected regions not regularly included in the Department's offerings in regional geography (e.g. tropical Africa, Europe, Oceania). Students should consult the Department regarding regions to be covered. [3-0] or [3-0; 3-0]
- 391 (3) Geography of Europe. – An introductory survey, focusing on the origins of the present-day human geography of the area between the Atlantic and the Ural Mountains. [3-0; 0-0]
- 395 (3) Introduction to the Geography of the Americas. – Physical environment, demographic and cultural patterns, trends in settlement and resource use. Frequent interamerican comparisons, especially along critical contact zones and regarding implications of liberalized relations. [3-0; 0-0]
- 401* (3) Urban Meteorology – The impact of urbanization upon atmospheric processes and climates. The energy and water balances of cities. Meteorological effects (urban heat island, precipitation modification, etc.) and their significance. Models of the urban atmosphere. Prerequisite: ATSC/GEOG 300. [0-0; 3-0]
- 402* (3) Air Pollution Meteorology – The nature of atmospheric pollutants. The ability of the atmosphere to disperse, transform and remove pollutants. Air pollution dispersion models. Air quality monitoring, criteria and standards. Prerequisite: ATSC/GEOG 200 and 300. [2-2; 0-0]
- 403* (3) Global Climate and Climate Change – The global climate system. Climates over the geological, historical and instrument periods. Theories of climatic change. Monitoring and modelling the climate system. Impacts of change on environmental and socio-economic systems. Prerequisites: ATSC/GEOG 200 and 300. [0-0; 3-0]
- 405* (3) Fluvial Geomorphology – Introduction to open channel flow and sediment transport. River morphology and channel types. Palaeohydrology. The development of channel networks. (+05/406 given in alternate years.) Prerequisite: GEOG 306. [0-0; 2-2]
- 406* (3) Hillslope Geomorphology – Hillslope processes and their rates of operation. Spectrum of geomorphic events on slopes and phenomena resulting from instability on soil and snow slopes. Slope evolution over long periods. (+05/406 given in alternate years.) Prerequisite: GEOG 306. [0-0; 2-2]
- 407* (3/4) c Directed Studies in Physical Geography – for fourth-year students in Geography to permit investigation of a topic to be agreed upon by a member of the faculty and the student. Permission of the Head of the Department and of the supervising faculty member is required. Credit will be given for only one of GEOG 407 and 448.
- 408* (3) Snow and Ice Processes – Formation of snow and ice masses and their evolution including snowpacks, glaciers and sea ice. Relationships between snow, ice and climate including avalanche forecasting. Weekend field trips. Prerequisite: GEOG 205. [2-2; 0-0]
- 410 (3) Geography and Resource Analysis – Geographical analysis of society-environment systems. Relates resource allocation, use, and development to changing demand, technology, policy, institutional arrangements, and social values. Prerequisite: GEOG 310. [3-0]
- 417 (3) Physical Environment of the City – The impact of urbanization upon the natural environment and vice versa. Aspects of urban climate, soils, hydrology, physiography, vegetation, and wildlife. Urban metabolism, pollution, waste management, and natural hazards. Past, present, and future urban environments. Prerequisite: GEOG 310. [0-0; 3-0]
- 422 (3) Modes of Subsistence – The nature of subsistence systems antedating or alternative to modern commercial systems. Introductory survey with basic readings; focus on problems such as the development of complex cultures without agriculture, the ambiguity of hunting and gathering, agricultural and other "intensification," "orchestration" of the use of adjacent microenvironments. Of interest to students of archaeology, anthropology and cultural geography. Same as ANTH 422. [3-0]
- 423 (3) Attitudes Toward the Environment – An examination of attitudes that have influenced land use and environmental change in the past and present. Prerequisite: GEOG 310. [3-0]
- 425 (3) Historical Geography of China – China from the Neolithic, stressing the beginnings and changing geographical patterns of various technologies and economics, institutions, and cultures. Normally alternates with GEOG 485. [0-0; 3-0]
- 426 (3) Historical Geography of British Columbia, I – Social, cultural, and economic geographies of native and immigrant societies to 1930. This course is not open to students who have taken GEOG 427. Prerequisite: GEOG 327 and 328 are recommended. [2-1; 0-0]
- 428 (3) Historical Geography of British Columbia, II: Research Seminar. – Approaches to research in historical geography. Field trip: participation recommended but not required. Prerequisites: GEOG 426 and one of GEOG 321, 327, 328, 445, HIST 404, ANTH 304, 352, or 420. This course is not open to students who have taken GEOG 427. Limited enrolment for non-Geography majors. [0-0; 0-3]
- 440 (3) Power, Knowledge and Human Geography. – Geography as discourse; power, modernity and the production of space; imaginative geographies and the representation of space. Prerequisite: GEOG 345. (0-0; 3-0)
- 448 (3) Directed Studies in Geography – For fourth-year students in Geography to permit investigation of a topic to be agreed upon by a member of the faculty and the student. Prerequisite: Permission of the Head of the Department and of the supervising faculty member. Credit will be given for only one of GEOG 407 and 448.
- 449* (3/6) d Honours Essay – Carries 6 credits Science credit for students in the Faculty of Science, except for Honours Climatology students, who will receive only 3 Science credits.
- 450 (3) Urban Analysis – Geographic analysis of selected problems of the internal structure of cities and urban systems. Prerequisite: GEOG 350 or permission of the instructor. [0-0; 3-0]
- 453 (3) Political Geographic Analysis – Analysis of the political organization of space at selected geographic scales (international to urban); development of political policy, organization, and behaviour, and their locational consequences; decision making and conflict resolution. Prerequisite: GEOG 329 or 350. [0-0; 3-0]
- 457 (3) Social and Behavioural Geography – Traditions in social geography; the French school; the concept of place; social space; class, caste, and spatial behaviour; urban perception; controlling urban space; territorial groups; urban behaviour settings; decision-making worlds in the city; urban microstudies in North America and Europe; the meaning of the city. Prerequisite: GEOG 350 or 357. [0-0; 3-0]
- 460 (3) Geography of Manufacturing – Industrial location theory; factors in the location of the firm; manufacturing and regional development. Case studies. Field trip. Prerequisite: GEOG 361 or GEOG the former 260. [0-0; 3-0]
- 464 (3) Spatial Interaction – The concepts of distance and accessibility; theories relating to diffusion, commodity flow, and human travel behaviour, and their application to economic activity analysis. Prerequisite: GEOG 350 or 361. [0-0; 3-0]
- 468 (3) Geography of International Economic Systems: Canada and the Pacific Basin. – An introduction to the study of international economic systems illustrated by the study of Canada's relations with the countries located in the Pacific Basin. Normally alternates with GEOG 481. [2-1; 0-0]
- 472* (3) Advanced Geographic Information Systems. – Theoretical and practical aspects of Geographic Information Systems, including cartographic modelling, digital terrain models, management issues and spatial interpolation. Limited enrollment. Prerequisite: GEOG 370, or com-

- pleted second year of a Geography B.Sc. degree with some introductory knowledge of GIS. [0-0; 2-2]
- 481 (3) Geography of Japan – A critical analysis of significant human adaptations to changing ecological conditions in the Japanese archipelago. Normally alternates with GEOG 468. Prerequisite: GEOG 380 recommended. [0-0; 3-0]
- 484 (3) Geography of Southeast Asia – A critical analysis of significant human adaptations to changing ecological conditions in the region, with particular reference to the Malay World. Prerequisite: GEOG 380 recommended. [0-0; 3-0]
- 485 (3) Geography of China – An introduction to the changing cultural, social and economic geography of China. Normally alternates with GEOG 425. Prerequisite: GEOG 380 recommended. [3-0; 0-0]
- 493 (3) Geography of Eastern Europe – Communist-era policies for economic and social development: their regional impact and their legacy for the post-Communist states. Current regional development problems. Normally alternates with GEOG 494. Prerequisite: GEOG 391. [0-0; 3-0]
- 494 (3) Geography of the Ex-Soviet States. – Soviet policies for economic and social development: their regional impact and their legacy for the ex-Soviet states. Current regional development problems in the ex-Soviet realm. Topics and regions examined vary from year to year. Normally alternates with GEOG 493. Prerequisite: GEOG 391. [0-0; 3-0]
- 495 (3) Selected Latin American Habitats – Physical environment, inhabitants, and livelihood systems along transects from densely settled uplands to tropical lowlands in Middle and South America; altitudinal interrelationships; changing human-land interaction from earliest entries to the present and associated changes in landscape. Prerequisite: GEOG 395 recommended. [0-0; 3-0]
- 497 (3) Geography of the Canadian Arctic – The patterns of physical and human geography in Canada's northland; the impact of the physical environment on the human occupancy of the north; exploration, trade, and settlement; northern resources; current economic and social problems. [3-0; 0-0]
- 499 (3) Economic and Social Geography of Canada – An examination of the political economy of regionalism in Canada. Geographical attributes of selected contemporary issues. Prerequisite: GEOG 290 and either GEOG 327 or GEOG 328. Open to fourth year students only. [0-0; 3-0]
- 500* (3) Physical Geography – Contemporary research trends in physical geography. Description and identification of environmental systems. Appropriate measurement and sampling designs in physical geography.
- 501* (3) Processes in Geomorphology – Theoretical and empirical analyses of the major processes of landscape evolution with particular emphasis on fluvial and glacial processes and mass movement.
- 502* (3) Boundary-Layer Meteorology – Theoretical and empirical analysis of the atmospheric boundary layer with particular emphasis on energy and mass exchanges near the Earth's surface.
- 503* (3) Topics in Geomorphology and Hydrology – Topics (chosen to fit student needs in any given year) include: experimental methods and scale problems in geomorphology and hydrology; runoff, sediment, and solute source analysis; watershed mass balance and management.
- 504* (3) Topics in Climatology – An introduction to the historical context, theory, and methods associated with current research topics in climatology. Topics chosen to fit the needs of the students in any given year.
- 505* (3) Permafrost – Occurrence and characteristics of frozen ground, with particular reference to ground ice. Climatic and other environmental determinants of geocryological phenomena. Theory of ground ice formation. Patterned ground.
- 507* (3-6) c Directed Studies in Physical Geography
- 508* (3/6) d Advanced Seminar in Geomorphology
- 509* (3/6) d Advanced Seminar in Climatology
- 510 (3/6) d Spatial and Cartographic Techniques – Analysis of spatial data involving statistical methods, mathematical modelling, and computer mapping, with emphasis on cartographic analysis and display of data.
- 515* (3) Satellite Remote Sensing Applications to Oceanography and Meteorology – A review of the many satellite-sensed data products used in both research and operational aspects of oceanography and meteorology. (Same as Oceanography 526.)
- 516 (3) Advanced Geographic Information Systems – The structure of geographic data bases. Evolution of cartographic data structures. Applications in geography.
- 517 (3) Environmental Sustainability – Environmental sustainability is examined through conceptual literature and empirical examples. Emphasis on links between the natural and social sciences. Case studies are used to discuss appropriate scales of development, potential limits to growth, and geographic distribution of benefits and costs associated with resource allocation and development.
- 520 (3) Human Geography – Themes and interpretive issues in modern human geography.
- 521 (3) Philosophy, Social Theory, and Human Geography.
- 522 (3) Feminism and Geography. – Feminist critiques of the discipline of geography and feminist reconstructions of geography.
- 530 (3) Urban Social Geography – An examination of empirical research in social urban geography, including such topics as the geography of social problems, the quality of life, the geography of minority groups, migration, tourism, and the experience of place.
- 531 (3) Urban Systems in Developed Countries – Analysis of changing urban systems, with examples drawn primarily from Canada, the United States, and the United Kingdom.
- 532 (3) Urbanization in Developing Countries – Problems of urbanization in developing countries as illustrated by Asian case studies.
- 534 (3/6) d Economic Geography – Recent literature on the spatial organization of economic activity.
- 536 (3/6) d Cultural Geography – Theories of culture and methods of cultural geography applied either to the cultural ecology of subsistence systems or to the geography of advanced societies.
- 537 (3) Society and Environment in British Columbia. – Analysis of geographical change in a recently-colonized, recently-modernized corner of North America.
- 538 (3) Historical Urban Geography – Social and economic geography of early Canadian and American cities.
- 539 (3/6) d Topics in Human Geography
- 548 (0) Major Essay
- 550 (3/6) d Directed Reading in Human Geography
- 556 (3/6) d Advanced Seminar in Human Geography
- 599 (12) Master's Thesis
- 699 Ph.D. Thesis
- Geological Sciences** **GEOL**
DEPARTMENT OF GEOLOGICAL SCIENCES,
FACULTY OF SCIENCE
- Geology 150 is a co-requisite for GEOL 200 whereas for all other Geology courses, except Geology 310, Geology 100 or 150 is prerequisite. Students taking courses in Geological Sciences may be required to participate in field trips.
- ** Additional fees are charged for these courses. See index "Fees - Special Fees".
- 100 (3) Introduction to the Earth – Origin and structure of the planet; plate tectonics as the driving force of volcanism, earthquakes, mountain belts and movement of conti-
- nents; shaping of the surface by erosion and sedimentation; geologic aspects of environmental concerns and material hazards. Lab topics include crystals, minerals, rocks and field study. [3-2; 0-0] or [0-0; 3-2]
- 150 (3) Earth Science for Engineers – Focuses on the intelligent interaction between society and the geologic environment. Locating, assessing and developing natural resources; understanding and preparing for natural hazards; design of structures and waste disposal sites. For Applied Science and Forestry students only. [3-2-0; 0-0-0]
- 200 (3) Introductory Mineralogy – Introduction to crystallography, physical and chemical properties of minerals. Recognition and identification of common minerals. Prerequisites: CHEM 110, 120 or 151; PHYS 110, 115, 120 or 153. Pre- or co-requisite: GEOL 100 or 150. [2-3; 0-0]
- 202 (3) Introductory Petrology – Optical mineralogy and the classification and genesis of igneous, metamorphic and sedimentary rocks. Prerequisite: GEOL 200 [2-3-0]
- 205 (3) Geological Time – Measuring geological time and understanding Earth history using stratigraphic principles, paleontology and radioactive decay. Prerequisite: GEOL 100 or GEOL 150 or a standing of at least B- in GEOL 120 or GEOG 101. [0-0; 2-2]
- 235** (3) Field Techniques – Introduction to the techniques of geological mapping and the interpretation of field data. Includes three one-day field trips on weekends plus a seven-day field school after Spring examinations. A fee is to be paid by January 31. Prerequisite: GEOL 100. Corequisites: GEOL 202, one of 205 or 256
- 251 (3) Geomorphology – Study of the processes and principles of land formation; types of land forms and their distribution; applications in engineering and resource development. Prerequisite: GEOL 100 or GEOG 101. [3-2; 0-0]
- 256 (3) Stratigraphy and Sedimentology – Introduction to stratigraphy, sediments and sedimentary rocks; facies and correlation, diagenesis, introductory petrology of sedimentary rocks; sedimentary mineral deposits and energy resources. Prerequisite: GEOL 100, 150 or GEOG 101. [0-0; 2-2*]
- 301 (3) Sedimentology – Origin, diagenesis and geochemistry of sediments and sedimentary rocks. Prerequisite: GEOL 256, or 202 and 205. [0-0; 2-2]
- 302 (3) Principles of Igneous Processes – Study of igneous processes with emphasis on the origins of volcanic rocks and deposits. Prerequisite: GEOL 202 [2-3-0]
- 303 (3) Metamorphic Petrology – Deciphering lithospheric processes as recorded by the mineralogy, chemistry and textures of metamorphosed rocks. Prerequisite: GEOL 202, MATH 101 or 102, CHEM 201 and 202 or 205 or 208. [0-0-0; 2-3-0]
- 307 (3) Structural Geology I – Analysis and interpretation of natural deformation. Prerequisites: GEOL 202, 205, 235. [2-3; 0-0]
- 308 (3) Introduction to Mineralogy and Petrology – The common minerals and rocks, and the processes that formed them. Not for credit for students in Geological Sciences or in Geological Engineering. Credit will not be given for GEOL 308 and 200. [2-3; 0-0]
- 309 (3) Experimental Methods in Mineralogy – Introduction to the crystal chemistry of minerals, and to X-ray diffractometry (powder and single-crystal), scanning and transmission electron microscopy, electron probe microanalysis, and spectrometric methods. Prerequisites: GEOL 200; CHEM 208. [0-0; 2-3]
- 312 (3) The Earth System and Environmental History – Earth's environmental history and aspects of contemporary global change. Plate tectonics, mass extinction, and the Gaia Hypothesis. Not for credit in the Faculties of Science or Applied Science. [3-0-0]
- 313 (3) Earth and Life Through Time – The fossil record of adaptation and extinction emphasizing the interaction of

- biological and geological processes. Prerequisites: third year standing in science and Biology 100 level. Not for credit in the Geological Sciences program. [3-0-0]
- 315 (3) Geological Analysis – An introduction to the use of mathematical techniques in geology; geostatistical analysis, mathematical simulation of geologic processes. Prerequisite: MATH 200; STAT 200; GEOL 200 and one of 205 or 256. [0-0; 3-2]
- 323 (3) Introductory Geochemistry – Origin, distribution and cycles of elements in the earth; evolution of the ocean and atmosphere; introduction to low temperature aqueous solution geochemistry. Prerequisites: GEOL 200; CHEM 208. [2-2; 0-0]
- 333 (3) Analytical Geochemistry – Application of chemical and instrumental methods to the analysis of silicate rocks and minerals; sampling problems in geochemistry. Prerequisite: GEOL 200. [0-0; 2-3]
- 335² (3) Field Geology – Recording and processing geological data in the field. Held within the three weeks following April examinations after Third year. A special fee is to be paid by January 31. Prerequisites: GEOL 251, 307 and 302 or 303
- 342 (3) Groundwater Hydrology – Introduction to theory of groundwater flow; flow nets; regional groundwater resource evaluation; well hydraulics; role of groundwater in geologic processes. [2-2²; 0-0-0]
- 351 (3) Structural Geology – Introduction to descriptive structural geology with applications to ore controls. Not for credit for students in Geological Sciences or Geological Engineering. Prerequisites: GEOL 200 or 308. [0-0-0; 2-3-0]
- 358 (3) Ore Microscopy for Mineral Engineers – Application of the reflecting microscope to the examination of ores and mill products. For students in Mining and Mineral Process Engineering only. Prerequisite: GEOL 308. [1-3-0; 0-0-0]
- 368 (3) Introduction to Mineral Deposits and Exploration Geology – Introduction to economic geology and models related to mineral exploration. Study includes typical deposit types in their plate tectonic setting. Prerequisite: GEOL 200 or 308. [2-2-0; 0-0-0]
- 403 (3) Petrologic Processes – Quantitative introduction to the transport of energy and matter in the Earth's crust as deduced from the study of igneous and metamorphic rocks. Prerequisite: GEOL 302 and 303. [0-0-0; 2-3-0]
- 405 (3) Geomathematical Models and Computer Applications in Geology – Problems in geochemistry, petrology and mineral deposits, identification of variables, computation; analysis of solutions. Independent use of mathematical software requires computer literacy. Prerequisites: GEOL 202 [2-3]
- 406 (3) Advanced Sedimentology – Description and interpretation of ancient and modern sediments, with emphasis on the origin, composition, textures, structures, diagenesis and chemistry of terrigenous sediments. Prerequisite: GEOL 201 and one of GEOL 226 or 256. Offered in alternate years. [2-2; 0-0]
- 407 (3) Structural Geology II – Studies of natural deformation using advanced techniques. Prerequisite: GEOL 307. [0-0; 2-3]
- 420 (3) Advanced Mineral Deposits – Magmatic evolution, fluid inclusions, stable isotopes, geothermometry and geobarometry, radiogenic isotopes, alteration, zonation and exploration. Corequisite: GEOL 368 [0-0; 2-3]
- 421 (3) Paleontology – Assessment of the geological impact of life both before and after the advent of hard skeletons. Fossilization processes; skeletal composition and structure; numerical taxonomy; bioerosion; biostratigraphy; and paleobiogeography in the context of plate tectonics. Prerequisite: GEOL 205. Given in alternate years. [0-0; 2-3]
- 425 (3) Geologic Evolution of North America – An overview of the tectonic evolution of North America with emphasis on the Phanerozoic orogenic belts, especially the Cordillera; comparison and contrast of Phanerozoic and Precambrian orogens; interrelations of sedimentation, deformation, metamorphism and magmatism; interpretation of the tectonic story in terms of plate tectonic processes. Prerequisite: 12 credits of Earth Science. [0-0; 3-0]
- 426 (3) Marine Geology – History and methods; morphology and plate tectonics of ocean basins; hot spots and seamount chains; processes at mid-oceanic ridges; relations between oceanic circulation and sediments; continental margins. Prerequisites: GEOL 302, 304. [2-3; 0-0]
- 428 (3) Ore Petrology – Mineralogy of ore deposits using optical microscopy and electron beam techniques. Prerequisite: GEOL 302 or 303. [2-3; 0-0]
- 436 (3) Sedimentary Basin Analysis – Cratonic and Marginal Basins: tectonics and basement structure and composition; sedimentary and thermal histories of basins, with emphasis on the Western Canada sedimentary basin; oil and gas reserves. Prerequisite: GEOL 445 or permission of the Head of the Department. [0-0-0; 2-3-0]
- 438 (3) Water-Rock Interactions – Introduction to irreversible mass transfer between aqueous solutions and rocks as applied to problems in weathering, groundwater geochemistry, ocean geochemistry, environmental contamination, diagenesis, hydrothermal ore formation and geothermal systems. Prerequisites: CHEM 208, GEOL 323. Not offered every year. [0-0; 2-2]
- 439 (3) Geological Fluid Dynamics – Fluid dynamics in a geologic context, with applications particularly to volcanic eruptions, meteorite impacts and river hydraulics; derivation of conservation equations, problem solving. Prerequisite: GEOP 230, PHYS 314 or MECH 280 and permission of the Head of the Department. [3-0-0]
- 442 (3) Groundwater Contamination – Contaminant transport processes in groundwater flow systems; aqueous and multiphase transport; mathematical models describing migration and chemical evolution of contaminant plumes; case studies. Prerequisite: GEOL 312. [0-0; 2-2]
- 443 (3) Groundwater Geochemistry – Quantitative approaches to practical groundwater geochemistry problems. Equilibrium thermodynamics, kinetics, complexation, oxidation reduction, cation exchange, sorption and partitioning of organics. Case Studies. Prerequisite: GEOL 323 or CHEM 301. [0-0; 2-2]
- 444 (3) Groundwater Remediation – Methods for containment and remediation of subsurface contaminants; including groundwater control, groundwater extraction, and in situ treatment. Experience with common design approaches. Corequisite: GEOL 112. [0-0-0; 2-0-2]
- 446 (3) Fossil Fuels – Origin, geochemistry and distribution of petroleum and coal in the stratigraphic record. Semimentation of organic matter, organic diagenesis, migration and accumulation of hydrocarbons. Principles of exploration and development. Techniques for measurement of organic maturation and source rock analyses. Prerequisites: GEOL 256 or 301 [2-2-0]
- 448 (3/6) c Directed Studies in Geology – Investigation of a topic to be agreed upon by a member of the faculty and the student. Permission of an undergraduate adviser and of the supervising faculty member is required before registration.
- 449 (6) Thesis – All Honours students are required to submit a thesis involving original research on a subject approved by the Department. Restricted to students in the Honours program.
- 452 (2) Geotechnical Engineering Practice – Application of the principles and techniques of geology, geophysics, soil mechanics and rock mechanics at engineering sites. Analysis of projects and problems on a local and regional scale. Case histories. Prerequisites: GEOL 342, CIVL 310, MMPE 303. [0-0-0; 2-0-0]
- 462 (3) Principles of Geological Engineering – Role of geology and hydrogeology in siting, design, and construction of engineering structures; synthesis of rock mechanics and soil mechanics methods in various geological environments; introduction to computer applications in geological engineering. Prerequisites: GEOL 342, CIVL 310 and 311, or permission of the Head of the Department. [2-2; 0-0]
- 499 (6) Thesis – For B.A.Sc. degree. Topic to be approved by the Department. [0-3-0; 0-3-0]
- 500 (3) Advanced Mineralogy – Crystal structure, chemistry, origin and paragenesis of major rock-forming and ore minerals.
- 504 (3) Geodynamics – A review of plate tectonics; geometry, processes, causes and geologic consequences.
- 506 (3/6) d Marine Geology and Sedimentology – The development of ocean basins and of the sediments contained within them. Modern processes are emphasized and used as examples in the interpretation of ancient deposits.
- 509 (3) Advanced Experimental Methods in Mineralogy – Scanning electron microscope, electron microprobe, X-ray powder and single crystal, diffraction, and other experimental instruments and methods.
- 510 (3) High Pressure Mineralogy – The physical and chemical properties of minerals as they relate to their geological and geophysical behaviour. Current techniques for determining relevant properties of minerals at high pressure and temperature.
- 512 (3) Glacial Geology and Quaternary History – Seminar. Characteristics, environments and histories of glacial and proglacial deposits; floral, faunal and climatic indices; isostatic and eustatic shifts in sea levels. Prerequisite: GEOL 308.
- 513 (3) Geochronometry – History, theory, techniques, applications and interpretations of geochronometry, using naturally occurring radioactive isotopes. Radiogenic isotopes as tracers of geological processes. Discussion of current research problems involving the Canadian Cordillera, other geological examples, dating of ore deposits, evolution of oceans and continents and results of lunar samples and meteorites. Given in alternate year.
- 516 (3) Problems in Carbonate Geology – Lectures, seminar and laboratory. Problems of the origin of carbonate bodies in different climatic environments. Identification of cold water and warm water carbonates and of shallow water and deep water carbonates and their associations. Given in alternate years.
- 521 (3) Problems in Paleontology – Seminar: principles of paleontology, taxonomy and evolution applied to selected pre-Cenozoic metazoan invertebrate groups.
- 523 (4) Advanced Geochemistry – Seminar and problems. Given in alternate years. Prerequisites: GEOL 573 and 583.
- 526 (6) Mineral Deposits – Seminar: character, origin, and structure of mineral deposits, with emphasis on ore deposits.
- 528 (3) Exploration Geochemistry – Distribution of elements in relation to mineralization; application of geochemical techniques to mineral exploration.
- 531 (3) Advanced Micropaleontology – Application of microfossils to biostratigraphy and paleoecology; morphology and systematics of various microfossil groups.
- 534 (3) Mechanics of Natural Deformation – Lectures and laboratory problems.
- 536 (3) Biogenic Sediments and Earth's Environmental History
- 541 (3) Paleobotany – Origin and history of plants through geologic time. Paleozoic, Mesozoic and Cenozoic floras. Techniques of collecting, preparation and identification of fossil plants and pollen. The use of fossil plants as indicators of geological age and ecology.
- 544 (3) Characterization of Porous Media – Nature of porous media on the microscopic and molecular scale; measurement of physical properties; interpretation of mechanical and transport properties.
- 547 (3) Advanced Coal Geology – The origin and character of coal and associated strata. Petrology, chemistry and phys-

cal properties of coal. Sedimentology of peat, biochemical and geochemical stages of coalification and oxidation of coal. Use of organic matter as a geothermometer and in-basinal analysis. Structural analysis and character of coal deposits. Analytical methods applied to coal.

549 (6-12) Master's Thesis

551 (3) Permafrost Engineering – Geomorphic and geotechnical engineering aspects of permafrost and ground ice. Prerequisites: CIVL 311, and GEOG 306 or GEOL 351.

552 (3) Advanced Geotechnics – Advanced topics in engineering geology. Emphasis will be on the physics of geological failures and the mathematical modelling of such failures for the purposes of analysis, prediction and design at engineering sites. Prerequisite: GEOL 452.

553 (3) Advanced Igneous Petrology – Lectures, seminars and laboratories on the application of physical chemistry to the origin of igneous rocks; crystallization processes in silicate magmas; melt physical properties, heat transfer and fluid flow.

554 (3) Structure and Properties of Crystals and Crystal A – Seminar and laboratory.

558 (6) Theory of Ore Search – Lectures, seminars, and problem sessions in the selection and evaluation of areas of search for economic mineral deposits; appraisal of geological, geophysical, geochemical methods and data; economic considerations. Case histories. Prerequisite: MMPE 351 (or concurrently), GEOL 419 and 420, or with permission of the instructor.

562 (3) Advanced Groundwater Hydrology – Finite-difference models of steady-state and transient groundwater flow in the saturated and unsaturated zones; applications to regional groundwater flow, groundwater recharge, subsurface contributions to streamflow, and aquifer evaluation. Prerequisites: GEOL 342 and MATH 316 or 256.

563 (3) Advanced Metamorphic Petrology – The characterization of metamorphic processes using mineral assemblages, mineral compositions, thermodynamics, and mass conservation equations.

564 (3) Transport Processes in Porous Media – Transport of mass and heat in groundwater flow systems; modelling techniques including an introduction to the finite-element method; modelling of groundwater contamination. Prerequisites: GEOL 342, 412, MATH 256 or 316, or permission of the instructor.

565 (3) Applied Groundwater Flow Modelling – Mathematical principles of groundwater flow; detailed study of the equations of flow in confined and unconfined aquifers. Prerequisites: GEOL 342, MATH 256 or 316. Given in alternate years.

566 (2-3) Topics in Groundwater Hydrology – A survey of the principal literature.

573 (4) Geological Phase Equilibrium – Seminar and problems.

583 (4) Equilibria in Mineral Systems – Seminar and problems.

589 (0) Major Essay

593 (3) Laboratory Techniques in Experimental Petrology – Instruction and practice in the use of high pressure, high temperature experimental apparatus for phase equilibrium studies of silicates and oxides. Pressures up to 35 kilobars (4x10⁹ Pa) and temperatures up to 1500C.

595 (3/6) d Directed Studies in Geology – Advanced studies under the direction of a staff member may be arranged in special cases with the approval of the Head of the Department.

599 (6-12) Thesis – For M.A.Sc. degree.

649 Thesis – For Ph.D. degree (Science).

699 Thesis – For Ph.D. degree (Engineering).

Geophysics GEOP

DEPARTMENT OF GEOPHYSICS AND ASTRONOMY, FACULTY OF SCIENCE.

120 (3) Physics of the Earth System – Origin, evolution, structure, and processes of the planet earth. Structure of the core, mantle, lithosphere, hydrosphere, atmosphere, and magnetosphere. Energy and mass transfer processes; seismology, geomagnetism and solar-terrestrial relations. Emphasis on earth as a complex system in which interactions play a decisive role, e.g., plate tectonics, vulcanism and the development of atmospheres and oceans. Corequisite: MATH 101. Recommended corequisite: PHYS 101. [0-0-0; 2-2*-1]

230 (3) Geophysical Fields and Fluxes I – Application of classical theory of scalar and vector fields to geophysical sciences. Gauss' theorem. Conductive, convective and radiative energy flux, fluid flow and flow in porous media, sediment flux, biogeochemical cycles. Prerequisites: one of PHYS 101, 121, 110, 115, 120 Corequisite: MATH 200 [3-0; 0-0]

231 (3) Geophysical Fields and Fluxes II – Gravity, electrical, and magnetic fields as applied to earth system problems. Stokes theorem. Maxwell's equations. Prerequisites: GEOP 230. [0-0; 3-0]

232 (3) Introduction to Experimental Geophysics – Physical properties of geological materials determined from laboratory measurements and application to geophysical field surveys. Prerequisite: PHY 101, (121), MATH 101 (121). [0-0; 2-3]

300 (3) Environmental, Geotechnical, and Exploration Geophysics I – Principles of geophysical survey design, data acquisition, processing and interpretation with emphasis on near surface problems. Magnetic, seismic reflection/refraction, electromagnetic and ground penetrating radar surveys. Case history analysis of environmental and geotechnical problems. Prerequisites: MATH 200 or 253; third-year standing or higher in Science or Applied Science. [2-2-1; 0-0-0]

301 (3) Environmental, Geotechnical, and Exploration Geophysics II – Geophysical techniques for near surface and deeper structure. DC resistivity, induced polarization, gravity and electromagnetic surveys. Case history analysis of environmental, geotechnical and exploration problems. Prerequisite: GEOP 300. [0-0-0; 2-2-1]

320 (3) Introduction to Theoretical Geophysics – Tensor calculus, concept of continua, stress and strain, conservation and continuity equations, introduction to linear elasticity and fluid dynamics with geophysical applications. Prerequisites: GEOP 230, 231 or MATH 201. [3-0; 0-0]

321 (3) Seismology – Hooke's law for isotropic continua, elastic wave equation, reflection and refraction methods for imaging the Earth's internal structure, plane waves in an infinite medium and interaction with boundaries, body wave seismology, inversion of travel-time curves, generalized ray theory, crustal seismology, surface waves and earthquake source studies. Prerequisite: GEOP 320. [0-0; 3-3*]

322 (3) Analysis of Geophysical Time Series – Continuous and discrete Fourier transforms, correlation and convolution, spectral estimates, optimum least-squares filters, deconvolution and prediction, frequency-wave number filtering. A practical course on computer techniques applied to the analysis of a wide range of geophysical phenomena. Prerequisites: PHYS 101, (121), MATH 101 (121) [3-2-0; 0-0-0]

420 (3) Potential Methods – The theory and quantitative interpretation of potential field methods in geophysical exploration. Topics include gravity, magnetics, electrical and electromagnetic techniques. Prerequisites: PHYS 201 or 311, MATH 316 (or PHYS 312). [3-0; 0-0]

421 (6) Applied Geophysical Laboratory – Advanced techniques in geophysical data acquisition and interpretation including theoretical basis. Fields surveys and laboratory experiments involving gravity, magnetics, electrical, electromagnetic, and radiometric methods. Computer modelling, case histories and integrated geological/geophysical interpretations. Prerequisite: GEOP 230 or equivalent; Corequisite: GEOP 420. [2-3-0; 2-3-0]

426 (3) Advanced Physics of the Earth – Quantitative methods for determining the physical properties and structure of the earth. Basic inversion interpretation techniques for gravity, magnetic, seismic, paleomagnetic, radiometric methods. Thermal history and the evolution of the earth. Pre- or corequisites: MATH 315 and PHYS 312 (or MATH 316). [0-0; 3-0]

448 (2-6) c Directed Studies – A course designed to permit students to undertake an investigation of a topic to be agreed upon by a member of the faculty and the student. Permission of the Head of the Department and the supervising faculty member is required.

449 (6) Thesis – This course is available only to students enrolled in Honours Geophysics programs.

499 (6) Thesis for B.A.Sc. degree – Topic to be approved by the Department. [0-3-0; 0-3-0]

507 (3) Linear Inverse Theory – Model construction, appraisal of nonuniqueness, and inference in linear problems. Tomographic inversions.

511 (2-4) c Earthquake Seismology – Seismic source theory, wave propagation in layered media, anelasticity, free oscillations, instrumentation, data analysis and interpretation.

512 (2-4) c Geomagnetism and Aeronomy – Description of the geomagnetic field, dynamo theory of the origin of the geomagnetic field, transient magnetic variations, magnetic storms and ionospheric disturbances.

514 (2-4) c Geophysical Analysis – Lectures and seminars on applications of statistical communication theory to analysis of geophysical data, time series analysis, optimum linear systems, and decision theory.

516 (2-4) c Theoretical Glaciology – Lectures and seminars on theoretical aspects of glacier mechanics; flow, stress and temperature fields, sliding theory, flow instabilities.

517 (2-4) c Nonlinear Inverse Theory – Model construction, appraisal of nonuniqueness, and inference in nonlinear problems. Stochastic inverses, constrained optimization, joint inversions and image processing.

520 (2-6) c Directed Studies in Geophysics

521 (2-6) c Studies in Applied Geophysics

523 (2-6) c Information Processing of Geophysical Data

524 (2-6) c Studies in Glaciology

525 (3) Rock Physics – Topics include the material properties of porous rocks; the visco-elastic behaviour of rocks; elastic wave propagation and attenuations, and electrical properties.

526 (3) Theory of the Earth – A quantitative approach to understanding the earth through elasticity and anelasticity, thermodynamics, geochemistry, and geomagnetism. Specific topics include free oscillations, geodynamics, evolution of the earth, and magnetohydrodynamics with dynamo theory.

527 (2-6) c Theory and Methods in Seismic Interpretation – Topics to be selected from the following: Forward modelling, analysis and inversion procedures as used in multichannel reflection, wide-angle reflection and refraction studies of the lithosphere. Velocity analyses, wave equation migration, dip moveout, on, one-dimensional synthetic seismograms, tau-p methods, wavelets, inversion, two-dimensional ray tracing and synthetic seismograms, tomographic inversion.

549 (12) M.Sc. Thesis

599 (12) M.A.Sc. Thesis

649 Ph.D. Thesis

Geophysics and Astronomy **GEPA**
DEPARTMENT OF GEOPHYSICS AND ASTRONOMY,
FACULTY OF SCIENCE

- 310 (6) Exploring the Universe – Modern topics of astronomy and geophysics without the use of advanced mathematics. Cosmology, galaxies, quasars, stellar evolution, pulsars, black holes, origin of the solar system, age of planets, space exploration, earth's gravity and magnetic fields, seismology and earthquakes, continental drift, ice ages. This course is open only to students not registered in the Faculty of science or in Engineering. No background in science or mathematics is required. (Same as ASTR 310.) This course is not open to first-year students. [3-0; 3-0]
- 316 (3) The Solar System – Introduction to the sun, planets, and smaller bodies, including formation, evolution and dynamics of the solar system. Prerequisites: Six credits of geophysics or physics at the 200 level or above. (same as ASTR 316). [3-0]
- 317 (3) The Planets – Atmospheres, interiors, and surfaces of the planets and large moons, with emphasis on similarities, differences and evolution of planetary atmospheres and surfaces. Planetary magnetic fields and magnetospheres. Prerequisites: Six credits of geophysics or physics at the 200 level or above. (Same as ASTR 317.) [3-0]
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- Germanic Studies**
FACULTY OF ARTS. SEE ALSO LISTING UNDER
SCANDINAVIAN
-
- German** **GERM**
- 100 (6) Beginners German – Introduction to the language. Ability to communicate accurately in a variety of everyday situations, speak about past events and express ideas and hypotheses in German. (See also GERM 104 and 430.) [1-0; 4-0]
- 104 (12) Intensive Beginners' German – Accelerated course. Competence and fluency in everyday situations, ability to report and narrate past events fluently and to express opinions, familiarity with contemporary issues in the German-speaking societies. Covers GERM 100 and GERM 200. [7-0; 7-0]
- 110 (6) First-Year German – For students with previous untutored exposure to German. Emphasis on grammatical structures. Competence and fluency in everyday situations, ability to report and narrate past events fluently and accurately and to express opinions accurately, familiarity with contemporary issues in the German-speaking societies. [4-0; 4-0]
- 200 (6) Intermediate German – Competence and fluency in everyday situations, ability to report and narrate past events fluently and to express opinions, familiarity with contemporary issues in the German-speaking societies. Prerequisite: German 11 or 12 or GERM 100. [4-0; 4-0]
- 201 (3) The Cultures of the German-speaking Peoples (in English) – An introduction to the cultural history of the German-speaking peoples as reflected in their literature, art, and music. Recommended for Major and Honours students. Not offered each year; consult department. [3-0]
- 202 (3) Great Works of German Literature in Translation – Major works of German literature from the medieval period to the present in their European context. Possible works or authors to be discussed: Tristan, Faust, Thomas Mann, Kafka, Brecht, Canetti. Not offered each year; consult department. [3-0]
- 204 (12) Intensive Intermediate German – Accelerated course. Fluency in many relevant situations, competence in the most important areas of cultural life, familiarity with study resources and study skills, ability to participate in discussions of controversial issues and to write essays on selected topics in German. Covers GERM 200 and GERM 300. Prerequisite: German 11 or 12 or GERM 100. [7-0; 7-0]
- 210 (6) Second-Year German – Emphasis on the review of grammatical structures. Fluency in many relevant situations, competence in the most important areas of cultural life, familiarity with study resources and study skills, ability to participate in discussions of controversial issues and to write essays on selected topics in German. Prerequisite: GERM 110. [3-0; 3-0]
- 300 (6) Advanced German 1 – Fluency in many relevant situations, competence in the most important areas of cultural life, familiarity with study resources and study skills, ability to participate in discussions of controversial issues and to write essays on selected topics in German. Prerequisite: GERM 104 or 200 or 210. [3-0; 3-0]
- 301 (3) Twentieth-Century German Literature in Translation – Reading and discussion of selected works against the background of literary, social, and political developments in twentieth-century Germany with special emphasis on plays and novels dealing with the First World War and Nazism. Not offered each year; consult the department. [3-0]
- 302 (3) Contemporary German Literature in Translation – Reading and discussion of selected literary works from West, East, and the united Germany, as well as from Austria and Switzerland. Not offered each year. Consult department. [3-0]
- 310 (6) Advanced German 2 – Near-native competence and an advanced understanding of contemporary issues; fostering of study skills. Prerequisite: GERM 204 or 300. [3-0; 3-0]
- 320 (3) German Literature from the Post-Romantic Period to – Major literary trends and representative figures. [3-0]
- 321 (3) German Literature from 1900 to the Present – Major literary trends and representative figures. [3-0]
- 331 (3) Business German – Review of most important grammatical patterns in application to business geography, import-export trade, marketing, finance, accounting, taxation, workplace conditions and requirements; oral and written forms of presentation for work with German business. Prerequisite: GERM 200. [3-0]
- 339 (6) Third-Year Honours Tutorial [0-2; 0-2]
- 350 (3) Enlightenment and Classicism – Representative works with emphasis on Lessing, Goethe and Schiller. [3-0]
- 351 (3) The Romantic Period – Principal Romantic writers and their contemporaries. [3-0]
- 401 (3) The Cult of the Hero and its Parody in German Lite – The glorification and satirization of heroes and heroism in a variety of genres and periods. Works and authors to be studied might include Nibelungenlied, Faust, Gryphius, Kleist, Fontane, Brecht, Remarque. Not offered each year; consult the department. [3-0]
- 402 (3) Words and Music in German Literature – Study of individual works and of genres in which words and music have achieved symbiosis. Emphasis will be on the words, but the works as a whole will also be studied. Possible works and authors or composers: Lutheran hymn, Volkslied, Bach cantata, Romantic Lied, Zauberflöte, Richard Strauss, Brecht songs. The scope may be expanded to include music and the musician as a subject in literature. Not offered each year; consult the department. [3-0]
- 403 (3/6) d Studies in Modern German Culture (in English) – Topics of special interest, varying from year to year. [3-0] or [3-0; 3-0]
- 404 (3) The Former German Democratic Republic and its Literature. – This course explores through literature the historical circumstances that led to the foundation of the GDR, its self-justification and ideology, the critical views of its opponents, its crises and eventual dissolution. A variety of genres is studied by authors such as Brecht, Becher, Seghers, H. Kant, Ch. Wolf, Hacks, Plazndorf, Kunze, Kunert. Not offered each year; consult the department. [3-0]
- 405 (3) The Literature of Growing Social Consciousness – Concentrating on the nineteenth-century, this course traces the reflections in literature of changes in politics, society, ideas, and spiritual values. Readings drawn from a variety of genres by authors such as Heine, Büchner, Hebbel, Grillparzer, Nestroy, Schnitzler, Keller, Storm and Fontane. Not offered each year; consult the department. [3-0]
- 406 (3/6) d Selected Topics in German Literature – A study in depth of one topic of special interest, varying from year to year depending on interests of faculty and students. Possible topics: literature and film, the image of the outside world in German literature, individualism and conformism. Not offered each year; consult the department. [3-0] or [3-0; 3-0]
- 407 (3) The German Lyric from Goethe to the Present – Reading and discussion of selected texts against their cultural, social and political background. Not offered each year; consult department. [3-0]
- 410 (6) Advanced German 3 – Near-native competence and an advanced and transferrable understanding of contemporary issues. Prerequisite: GERM 310. [3-0; 3-0]
- 430 (6) German for Reading Knowledge – This course aims to develop a reading knowledge of German, sufficient to enable students to understand scientific and scholarly material. It provides basic grammar and practice in the translation of texts in the natural sciences, the social sciences, and the humanities into English. This course is not available for credit toward a Major or Honours program in German and does not satisfy the language requirement of the Faculty of Arts. [3-0; 3-0]
- 439 (6) Fourth-Year Honours Seminar [0-2; 0-2]
- 449 (6) Honours Essay [0-2; 0-2]
- 450 (3) German Literature of the Middle Ages [3-0]
- 451 (3) German Literature of Renaissance and Baroque [3-0]
- 500 (3/6) d Research Methods
- 501 (3/6) c Critical Approaches to Literature
- 502 (3/6) d History of the German Language
- 503 (3/6) d Introduction to Middle High German
- 505 (3) The Acquisition of German as a Foreign Language – Foundations, methods, and findings of second-language acquisition research in the field of German as a foreign language. Taught in German. An introductory six credit course in linguistics is recommended as preparation for this course.
- 511 (3/6) d Studies in Medieval Literature
- 512 (3/6) d Studies in Renaissance Literature
- 513 (3/6) d Studies in Baroque Literature
- 514 (3/6) d Studies in the Literature of the 18th Century
- 515 (3/6) d Studies in the Classical Period
- 516 (3/6) d Studies in Romanticism
- 517 (3/6) d Studies in the Literature of the 19th Century
- 518 (3/6) d Studies in Expressionism
- 519 (3/6) d Studies in the Literature of the Early 20th Century.
- 520 (3/6) d Studies in Literature after 1945
- 531 (3/6) d Special Topics
- 532 (3/6) d Genre Studies
- 533 (3/6) d Studies in Individual Authors
- 534 (3/6) d Studies in Austrian Literature
- 547 (3/6) c Guided Research
- 548 (0) Major Essay
- 549 (6) Master's Thesis
- 649 Ph.D. Thesis

Greek **GREK**
DEPARTMENT OF CLASSICS, FACULTY OF ARTS

- 100 (6) Beginners' Greek – An introduction to the fundamentals of reading and writing classical Greek. (Credit will not be granted for both GREK 100 and GREK 125.) [3-0; 3-0]
- 125 (6) Introduction to New Testament Greek. – See GREK 100. [3-0; 3-0]
- 200 (6) Second-Year Greek Prerequisite: GREK 100. [3-0; 3-0]
- 301 (6) Greek Literature of the Classical Period – Composition, Plato's Apology, and a tragedy. Prerequisite: GREK 200. [3-0; 3-0]
- 411 (3) Early Greek Historians. – Selections from the early Greek historians, primarily Herodotus. Prerequisite or corequisite: GREK 301. [3-0]
- 412 (3) Later Greek Historians. – Selections from Thucydides and Xenophon. Prerequisite or corequisite: GREK 301. [3-0]
- 416 (3) Greek Philosophy. – Selections from Plato and/or Aristotle. Prerequisite or corequisite: GREK 301. [3-0]
- 417 (3) Greek Oratory. – Selections from the Attic Orators. Prerequisite or corequisite: GREK 301. [3-0]
- 420 (3) Greek Drama, I. – Aeschylus and Sophocles. Prerequisite or corequisite: GREK 301. [3-0]
- 421 (3) Greek Drama, II. – Euripides and Aristophanes. Prerequisite or corequisite: GREK 301. [3-0]
- 422 (3) Greek Epic. – Selections from Homer's Iliad and/or Odyssey. Prerequisite or corequisite: GREK 301. [3-0]
- 423 (3) Greek Lyric and Elegiac Poetry. – Selections from the lyric and elegiac poets. Prerequisite or corequisite: GREK 301. [3-0]
- 425 (3) Advanced Composition – Obligatory for Honours students in the third or fourth year. Prerequisite or corequisite: GREK 301. [2-0]
- 521 (3/6) c Studies in Greek Literature
- 525 (3/6) d Seminar in Greek Literature
- 530 (3/6) d Seminar in Greek Archaeology
- 535 (3/6) d Seminar in Greek History
- 540 (3/6) d Seminar in Greek Palaeography
- 545 (3/6) d Seminar in Greek Epigraphy
- 517 (0) Major Essay.
- 549 (6/12) c Master's Thesis
- 550 (3/6) c Directed Studies
- 649 Ph.D. Thesis
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- Health Care and Epidemiology HCEP**
FACULTY OF MEDICINE
- 400 (3) Statistics for Health Research – Planned collection, numeric and graphic summarization, and elementary statistical analysis of data. Examples primarily from health sciences illustrate standard techniques for parametric and non-parametric hypothesis testing; regression and correlation; contingency tables. Also randomization, "blind-folding" and other specifically biomedical topics in statistics. Prerequisite: ability to use high school algebra and simple graphs. Attendance requires permission of the instructor and class size may be limited. [3-0; 0-0]
- 450 Preventive Medicine – The principles and application of epidemiology to the prevention, control and measurement of acute and chronic disease; occupational health and industrial medicine. (For Third year medical students only.)
- 451 (3) Epidemiology in the Practice of Medicine – An introductory course emphasizing the uses of epidemiologic concepts and techniques in clinical investigation and community medicine. This course has been designed as a basic science elective for third year medical students.
- 452 Health Care – Social medicine, including the community approach to health care and environmental medicine and the principles of medical care for Third-Year medical students.
- 454 (3) Systems and Computer Applications in Medicine – An introductory course emphasizing the uses and potential value of both the systems approach and computers in medical science and practice. This course is a basic science elective for third year medical students. (Not offered in 1995/96.)
- 475 (3/6) c Health Care – Social medicine, including the community approach to health care and environmental medicine and the principles of medical care. (Not offered in 1995/96.)
- 500 (3) Canadian Health Services – A seminar on issues and problems in the delivery of health care in Canada.
- 501 (3/6) c Seminar in Health Policy Analysis – 1. An analytical study of social policy and Canadian health policy making. 2. Projects based on the learning in Part 1. Analysis of health policy making by Federal Government and the Provinces; social policies; interest group activities in policy making in Canada. OPT. 2 not offered in 1994/95.)
- 502 (3) Measurement of the Health of Human Populations – Sources and uses of epidemiologic data for health services planning and administration including methods of data collection and study design. Permission of the instructor must be obtained before registration except for students in Health Care and Epidemiology graduate degree programs
- 503 (3) Analysis of Health Care Organizations – Analysis of models of organizational structures and processes in health care. Using open and closed systems theories of organizations (contingency, rational-bureaucratic, human relations, resource dependency and population-ecology) as a framework, relevant organizational factors and intra-organizational processes will be examined. Prerequisites: HCEP 540 or permission of instructor.
- 504 (3) Clinical Epidemiology – Principles and methods of epidemiology are applied to clinical problems. Evaluation and design of laboratory and clinical tests and of therapeutic interventions. Prerequisites: HCEP 400 and 502 or equivalent.
- 505 (3) Financial Management in Health Care – Capital/operating costs, structure, planning, valuation and budgeting systems for not-for-profit health care organizations; reimbursement and accountability policies; hospital mergers and acquisitions; purchased services and management contracts relevant to the health care field. (Not offered in 1995/96.)
- 506 (3) The Design and Analysis of Clinical Trials – Ethical considerations, intention-to-treat versus efficacy trials, principals of sampling and exclusion, methods of allocation and techniques of randomization, parallel versus cross over design, monitoring treatment outcomes, adverse effects, stopping rules, analytic techniques and data interpretation, and logistical issues in the management of clinical trials. Prerequisite: HCEP 502, 504 or permission of instructor.
- 507 (3) Industrial Toxicology I – Mechanism of action of commonly encountered occupational toxic agents; relevance of laboratory and epidemiological evidence. Prerequisite: M.D. or permission of instructor.
- 508 (3) Industrial Toxicology II – Effects of individual toxic agents on complete organ system; problems of specific industries. Prerequisite: HCEP 507.
- 510 (3) Occupational and Environmental Risk Evaluation. – Methods of evaluating occupational and environmental health risks, including the health exposure, economic, social, and ethical issues involved; case study approach will illustrate disease processes in a range of body systems. (3-0-0; 0-0-0)
- 511 (3) Occupational Epidemiology. – Design and analysis of etiologic research in occupational health. Prerequisite: HCEP 502. (0 3-0; 0-0-0)
- 512 (3) Introduction to Occupational Hygiene and Safety. Also listed as OCCH 501. (3-0-0; 0-0-0)
- 516 (3) Planning for Health Services – A critical analysis of planning activities in health service institutions. The course is organized around case studies of program planning. Prerequisite: HCEP 501.
- 517 (6) Health Management Project – Implementation of planning theory through the completion of a bounded project within a health agency, and under individual faculty supervision. Prerequisite: HCEP 516.
- 518 (3) Systems Modelling in Health Care – A study of health care using the mathematical modelling techniques of systems analysis and computer simulation. Modelling ranges from micro models such as an emergency ward to macro models such as a provincial health care system. Techniques vary from stochastic modelling of individual encounters to deterministic "flows" of health care. Introduction to relevant systems and control theory topics. (Not offered in 1994/95.)
- 519 (3) Health Information Systems – Information systems in planning and management of health care services provided through single-purpose units, comprehensive clinics and hospitals. Emphasis on computerized systems. Prerequisite: HCEP 523, or permission of instructor.
- 520 (3/6) c Social Research Methods in Health Care – A course by lecture and seminar which examines the range of social research methodologies and strategies appropriate for an analysis of health service systems and problems. Emphasis is given to research design. (Not offered in 1994/95.)
- 521 (3) Application of Social Science Concepts in Community Health and Health Promotion. – Seminar applying social and behavioural theories to research on planning, implementation and health care and health promotion.
- 522 (3) Measurement of Health Care – Concepts and techniques of measurement in health care and health services research. Topics covered include validity, reliability, and precision, specific types of scale design and the construction of questionnaires and indices in health. Scales commonly in use to measure quality of life, and state and change measurements in functioning. Techniques for measuring choice, such as time trade-off, a standard gamble. Prerequisites: HCEP 400, 502, 504 or permission of instructor.
- 523 (3) Operations Research in Health Care – Management control, program development and decision making in health service administration; measurement of performance in health services; staffing and scheduling; personnel management; forecasting; managerial control and resource allocation.
- 525 (3) Cancer Epidemiology – Collection and analysis of epidemiological data on cancer; occupational and other risk factors; analytic techniques and mathematical modelling relevant to oncology. (Not offered in 1995/96.) Prerequisite: HCEP 400 and 502 or equivalent.
- 526 (3) Selected Topics in Epidemiology – By seminars and directed readings, certain topics of current interest are explored in depth. The choice of topics will be decided by students and instructor, with relevance to thesis preparation where appropriate. Enrollment by permission of instructor; previous work in epidemiology and statistics is required.
- 527 (3) Analytical Methods in Epidemiological Research – Basic epidemiologic designs as a framework for commonly used biostatistical techniques such as the Mantel-Haenszel, chi-squared, linear and logistic regression, and survival analysis. Computer packages will be available for computation of assignments. Prerequisites: HCEP 400 and 502, or their equivalents.
- 528 (3) Demographic Principles and Methods in Health.
- 529 (3) Clinical Decision Analysis Prerequisites: HCEP 502, 504 or permission of instructor.

- 530 (3) The Delivery of Community Health Services – Presentation by lecture and seminar of the various aspects of community health practice including problem assessment and decision making. Permission of instructor is required. (Not offered in 1995/96.)
- 531 (3) Control of Communicable Disease – Epidemiology of viral, bacterial and parasitic infections with emphasis on the control of these infections in human populations. Immunization programs will be stressed.
- 533 (3) The Delivery of Primary Health Care – Examination and assessment of Primary Health Care schemes. Methods of financing personal health care. Use of health professionals. (Not offered in 1995/96.)
- 535 (3) Socio-Economic Factors and International Health Developments. – Defining poverty and health (including mental health). Measurements absolute and relative. World distribution of resources. Special problems of developing and developed countries. Canadian problems of poverty and health. Methods of financing health services, problems or distribution. Health professionals and semi-professionals. Communication problems.
- 536 (3) Health Services Research I: Evaluative Research – Examines the concept of evaluation in health services and how various methodological approaches can be used in evaluative studies. Prerequisites: HCEP #00 and HCEP 502 or equivalent.
- 537 (3) Health Law – Legal environment of health care including current legal issues encountered in health services administration, planning and policy.
- 538 (3/6) c Directed Studies
- 539 (3) Health Services Research II: Economic Evaluation – Economic evaluation of health service interventions and programs, with emphasis on methods and components of program costing. Prerequisites: ECON 384, HCEP 536 or permission of instructor.
- 540 (0) Clerkship – An attachment of three months to an approved preceptor in the field of health planning/administration. Prerequisites: completion of one year of full-time study (or equivalent).
- 541 (0) Health Management Forum – Presentations by clinical faculty on current topics, practices or advances in health care management followed by discussion. [2-0; 2-0]
- 545 (3) Seminar in Health Care Management – Assessment of approaches and development of sound strategies for addressing current problems and issues. Prerequisites: HCEP 516 and 540.
- 547 (3) Research Seminar – Required course in Ph.D. program. Topics of current interest will be presented and discussed by students and visitors.
- 549 (12) M.Sc. Thesis
- 599 (0) Major Essay – Required for all non-thesis Master's programs.
- 649 Ph.D. Thesis
- 710 Introduction to Community Medicine Practice – An introductory survey to Community Medicine.
- 711 Field Experience – A series of visits to facilities and organizations related to Community Medicine Practice. Directed by Faculty. At least four hours per month.
- 712 Supervised Work – A weekly review by Faculty of the work carried out by the resident with discussion on the objectives, planning, method of operation and outcome. Two hours per week.
- 713 Community Health Tutorials – Topics of Public Health interest presented throughout the year by Faculty and guest lecturers. Two hours per month.
- 714 Community Medicine Seminars – Selected topics of current interest in Community Medicine Practice or in its basic sciences. Presented by residents and discussed with Faculty and invited guests. Three hours per month.
- 715 Journal Seminars – A monthly two-hour seminar on selected journal articles of Community Medicine interest are presented by the residents and discussed with Faculty and invited guests.
- 716 Research in Community Medicine or its Basic Sciences by a Resident – Up to two days per week. Supervised by Faculty.
- 717 Introduction to Occupational Medicine Practice – An introductory survey to Occupational Medicine practice.
- 718 Fundamentals of Clinical Epidemiology – Seminar series covering critical appraisal of the medical literature and basic research methods for residents in any post-graduate training program.

Health Care Ethics HCET
DIVISION OF HEALTH CARE ETHICS, FACULTIES
OF: MEDICINE, PHARMACEUTICAL SCIENCES AND
DENTISTRY; SCHOOLS OF: AUDIOLOGY AND
SPEECH SCIENCES, NURSING, REHABILITATION
SCIENCES AND SOCIAL WORK

- 400 (3) Health Care Ethics – An interdisciplinary approach to health care ethics using case studies to illustrate a variety of ethical problems. Intended for students in the health care and related disciplines. [3-0]

Hebrew HEBR
DEPARTMENT OF RELIGIOUS STUDIES, FACULTY
OF ARTS

- 305 (6) Elementary Hebrew (Biblical) – Elements of grammar and translation of prose and poetry. Open to first- and second-year students with permission of the instructor. [3-0; 3-0]
- 405 (6) Intermediate Hebrew (Biblical) – Second year of Biblical Hebrew with emphasis on rapid reading of poetry and prose. Prerequisite: HEBR 305. [3-0; 3-0]
- 479 (3/12) c Supervised Study in Biblical Hebrew Prerequisite: HEBR 405.

Higher Education HIED
SEE EDUCATIONAL STUDIES, FACULTY OF
EDUCATION

Hindi HIND
SEE ASIAN STUDIES, FACULTY OF ARTS

Hispanic and Italian Studies
SEE ITALIAN, ITALIAN STUDIES, ROMANCE
STUDIES, SPANISH AND PORTUGUESE; FACULTY
OF ARTS

History HIST
FACULTY OF ARTS

- 101 (6) Europe from the Fall of Rome to the Reformation – The evolution of medieval Europe emphasizing structures and their changes: the ordering of society, the economy, beliefs and ideas, the organization of communities and their political development. [2-1; 2-1]
- 115 (6) Introduction to History and Philosophy of Science – An interdisciplinary introduction to the nature of science and technology; their place in modern culture. Will focus on several issues, their historical development and philosophical significance. The issues will vary from year to year. (Same as PHIL 115.) [2-1; 2-1]
- 120 (6) European History from the Renaissance to the Present – A survey of continuity and change in the economic and social foundations, and in the political, administrative, and military spheres, as well as some of the accompanying scientific, philosophical, literary, artistic, architectural, and other cultural achievements and styles of European civilization. [2-1; 2-1]
- 125 (6) Main Currents in Twentieth-Century History – International relations, the emergence and impact of major political ideologies, and the dynamics of social and economic change in the developed and developing world. [2-1; 2-1]
- 135 (6) The History of Canada – Some of the principal events in Canadian history and the various interpretations of them. [2-1; 2-1]
- 170 (6) Introduction to South Asia – Geographical, cultural, and historical backgrounds to India, Pakistan, and Bangladesh. Problems of political, economic, and social development since 1947. (Same as ASIA 115.) [3-0; 3-0]
- 171 (6) Introduction to East Asia – Geographical, ethnic and historical backgrounds of China, Japan, and Korea. Survey of twentieth-century East Asian history. (Same as ASIA 105.) [3-0; 3-0]
- 201 (6) The Colonial Experience in the Americas – A comparative study of selected colonial societies from their foundations into the 19th century. [2-1; 2-1]
- 202 (6) Modernization in Historical Perspective – Explores the transition from pre-industrial to modern society in western Europe from 1700 to the present, with some examination of the impact of this process on Asia, Africa, and Latin America in the nineteenth and twentieth centuries. [2-1; 2-1]
- 205 (3) Introduction to Historical Archaeology – An introduction to the study of medieval and modern material culture, with special emphasis on Canada, using archaeological evidence to illustrate the principles, aims, and techniques of historical archaeology and related disciplines. (Same as ANTH 205.) [3-0]
- 215 (6) Technology in History – An introduction to the history of technology and society from antiquity to the present. [2-1; 2-1]
- 237 (6) Major issues in American History – A general course, from the colonial period to the modern, examining the political system, slavery and the Civil War, manifest destiny and the frontier, urban and industrial America, and American foreign policy in the twentieth century. [2-1; 2-1]
- 250 (6) Latin American History – A general course designed to show, by discussion of the major issues of the last two thousand years, how the modern society and culture of Latin America came into being. [3-0; 3-0]
- 270 (6) Modern China and the West – The invasion of China since the 1900's by western civilization; the impact of Chinese culture and of the modern Chinese revolution on the West. Canadian relations with China included. Open to students with no previous knowledge of China. (Same as ASIA 270.) [2-1; 2-1]
- 271 (3) Japan and the World, 1550-1900. – Thematic study of comparisons and relations between Japan and the world outside (primarily Europe and China). Commercial expansion, systems of world order, social institutions, religious and ideological expression, and state organization. [2-1]
- 302 (6) History of the Native Peoples of Canada – The native people (status and non-status) of Canada from contact to the present. Topics include native involvement in the fur trade and later economic developments, the emergence of the Metis, the treaty-making process, and the evolution of government policies for native peoples. [3-0; 3-0]
- 303 (6) History of the Canadian West – Selected topics in the history of the Canadian West with an emphasis on the prairie west: the Indian and the fur trade, Louis Riel, prairie settlement, and western social, and political protest. [2-1; 2-1]
- 306 (6) History of France, 1461-1715 – The development of absolute monarchy in France, with emphasis on: change and conflict in French society; spiritual and intellectual "crisis"; the place of France in the emerging European state system; and opposition to the monarchy. [3-0; 3-0]

- 307 (6) French North America to 1803 – A historical background for understanding the French speaking peoples of North America, Acadians, Franco-Quebecois, French-Canadians, and Cajuns. It deals extensively with French-American relations and introduces the student to the historiography of French North America. [3-0; 3-0]
- 310 (6) British Imperial History – Rationales and criticisms of empire; economic systems; new societies and nationalist movements; representative individual empire builders. Covers late fifteenth century to the present with emphasis on the nineteenth and twentieth centuries. [3-0; 3-0]
- 313 (6) The Renaissance – The interplay between new and traditional ideas, styles and institutions from the fourteenth to the mid-sixteenth century, primarily in Italy, with emphasis upon the relationship of social, economic, and political factors to intellectual and cultural change. [3-0; 3-0]
- 315 (6) History and Social Relations of Science – Focuses on the Scientific Revolution (1500-1700) and its consequences for modern life. Topics include: science transformed from natural philosophy to technology; theories of nature and human nature; science and objectivity; the social role of the scientist; the intellectual authority of science. [2-1; 2-1]
- 316 (6) European Social History – A study of the changes in economic activity, social structure, family life, religious attitudes, and popular behaviour which accompanied the transformation of Europe from a pre-industrial to an industrial society. [3-0; 3-0]
- 317 (3) History of Southern Africa – Pre-colonial, colonial, and contemporary, stressing South Africa. [3-0]
- 321 (12) Honours Tutorial [0-2; 0-2]
- 322 (12) Honours Tutorial [0-2; 0-2]
- 324 (6) History of East Central Europe in the 19th and 20th – Covers the region between Germany and Russia as well as Southeast Europe. Emphasis on comparisons with Western Europe and features that make the area significant to Europe as a whole. [3-0; 3-0]
- 326 (6) The British North American Colonies, 1749-1873 – A comparative study of the British North American colonies that became provinces of the Dominion of Canada. Regional distinctions as well as shared characteristics are examined in the light of literature, folklore, social structure, art, architecture, and politics. [3-0; 3-0]
- 327 (3) American Colonial History, 1607-1763 – A comparative study of the social, economic and political characteristics of the thirteen colonies as they changed from small European outposts to more mature societies. [3-0]
- 328 (3) The American Revolution and the Formation of the United States – A study of the revolutionary origins of the United States and of the establishment of the American republic. [3-0]
- 329 (6) Canadian Social History – A study of selected topics in the history of Canadian society, including frontier settlement, rural life, religion, social and institutional structures, immigration and ethnicity, social movements, ideology, family life and life cycle, demographic change, labour, industrialization and urbanization. [3-0; 3-0]
- 330 (3) The United States, 1812-1865 – Political development in the new American nation, with special emphasis on expansion, regionalism, Jacksonian democracy, social reform, and the Civil War. [3-0]
- 331 (3) The United States, 1865-1896 – Political and social development in Post-Civil War America, with special emphasis on Reconstruction, industrialization, and the Gilded Age. [3-0]
- 332 (6) African-American History. – The experience of African-Americans from the time of their enslavement through the late 20th Century from an interdisciplinary perspective. (3-0-0; 3-0-0)
- 333 (6) Third-Year Honours Seminar [0-2; 0-2]
- 334 (6) Europe in the 19th Century – An investigation of main themes in European history from the French Revolution to the beginning of the 20th century. Topics of particular importance are: domestic politics; the interaction of states; the formation of new states; social and economic transformations affecting the whole civilization; major cultural expressions of the century. [3-0; 3-0]
- 335 (6) Gender, Politics, and Culture in Modern Europe – Relationships between changing gender roles and other historical processes from the French and industrial revolutions to imperialism, nationalism, and the rise of consumer cultures in Europe from the eighteenth century to the present.
- 338 (6) The United States in the 20th Century – American history from the First World War to the 1970's. While foreign affairs are treated in some depth, the course focuses primarily on the domestic scene. Economic developments, the current of ideas, social and political change receive special attention. [3-0; 3-0]
- 351 (3) Family and Community in Latin America – The role of family and community from the colonial period to the present. Emergence of the nation state affecting community and family structures. [3-0]
- 352 (3) Class and Culture in Latin America – The relationship between culture and class formation from the late colonial period to the present. [3-0]
- 353 (3) Politics and Society in Nineteenth-Century Latin America – The changing structure of power in Latin America 1820-1914, emphasizing the factors which prevented the establishment of viable political systems. Focuses mainly on Argentina, Brazil and Mexico. [3-0]
- 354 (3) Politics and Society in Twentieth-Century Latin America – The changing structure of power in Latin America since 1900, focusing on the political movements that have challenged the status quo. Concentrates on the experience of Mexico, Cuba, Brazil and Chile. [3-0]
- 370 (6) Social and Economic History of Medieval Europe – A general survey of social organization, of the development of public and private institutions, and of major changes in the economy and economic organization. [2-1; 2-1]
- 372 (6) Ideas and Institutions of the Middle Ages – Studies in medieval political ideas and the institutions of government and law. [3-0; 3-0]
- 380 (6) Modern Chinese History Since 1840 – An analysis of changes in institutions and ideas in China from the late Imperial Period to the most recent developments of the Chinese Revolution. Approaches are thematic, by periods, and by problems. (Same as ASIA 380.) [3-0; 3-0]
- 381 (6) The Civilization of Late Imperial China – Evolution of Chinese civilization from c. 1000 to 1600. The many-sided cultural and political legacy of the Sung period; the impact of the period of Mongol domination: the Ming period. Cultures of peoples who ruled part or all of China will be touched upon. Not offered every year. [3-0; 3-0]
- 382 (6) History of Chinese Civilization – A survey of Chinese history from ancient times to 1840, with emphasis on the period up to A.D. 1000. (Same as ASIA 320.) [3-0; 3-0]
- 383 (6) History of Japanese Civilization – Japanese political, social, and cultural history from earliest times to 1868. (Same as ASIA 330.) [3-0; 3-0]
- 384 (6) History of Indian Civilization – Political and cultural history from the earliest times to the medieval period. (Same as ASIA 340.) [3-0; 3-0]
- 385 (6) History of India since 1800 – Developments in Indian society and culture under the British Raj, the origins and growth of the freedom struggle, the emergence of independent states in the sub-continent, and problems of nation-building and modernization since 1947. (Same as ASIA 385.) [2-1; 2-1]
- 386 (6) History of Korean Civilization – (Same as ASIA 322.)
- 387 (3) Medieval India – The history, culture, and social and economic organization of South Asia from the decline of the classical Hindu empires through the Sultanate period. (Same as ASIA 387.) [2-1]
- 388 (3) Mughal India – History of the politics, economy, society, and culture of South Asia from the Great Mughals to the British conquest. (Same as ASIA 388.) [2-1]
- 389 (6) The Sikhs: History, Religion and Society – A historical study of the social and cultural forces that helped shape Sikh religious beliefs and ritual practices over the past four centuries. In dealing with the evolution of Sikh identity, due attention will be given to Sikh ideals, social organization, religious institutions and sacred literature. [3-0; 3-0]
- 400 (6) Intellectual History of Modern Europe – Concentrates on selected problems in the history of European social, political, and general philosophical thinking from the seventeenth century. The course emphasizes the careful reading of primary texts. [3-0; 3-0]
- 401 (6) French Canada from the End of the 18th Century to the Present – Examines the relations between the English and the Canadians prior to the Rebellions of 1837-38, the emergence of the "state of siege" mentality after 1840, the impact of industrialization in Quebec, the Quiet Revolution, and independence movement. [3-0; 3-0]
- 402 (3) Problems in International Relations: Diplomacy and the Origins of Wars – study of the relationship of the diplomatic factor to other factors in the origins of the First and Second World Wars. This seminar is open only to fourth-year students in the Major program in International Relations. [0-2]
- 403 (3) Seminar in the History of International Relations – Selected topics such as the role of diplomacy and its relation to other factors in international affairs, Canadian external relations, third-world international politics, Cold-War historiography, and area studies. Open only to fourth-year students in the Major program in International Relations. [0-2]
- 404 (6) British Columbia – Selected themes in the history of the region, primarily during the post-confederation years. Topics will emphasize changes in the economic, social, and institutional structures of the province. [2-1; 2-1]
- 405 (6) Russia Before 1917 – Beginning with the medieval period, the course will concentrate on the era from Peter the Great to the 1917 Revolution, emphasizing domestic developments, particularly the tensions between continuity and change in this epoch of transformation, crisis, and revolutionary movements. [3-0; 3-0]
- 406 (6) History of France since 1715 – In a given year, the course may emphasize a specific theme or period, e.g., French society, politics, and thought in the eighteenth century; Revolutionary France 1787-1871; France from the Paris Commune to the crises of 1968. [3-0; 3-0]
- 407 (6) History of Modern Germany – The political, social and intellectual history of modern Germany from 1789 to the present, with some emphasis on the preceding centuries. [3-0; 3-0]
- 408 (3) History of the Habsburg Monarchy – An examination of the growth and development of the monarchy with emphasis on the eighteenth and nineteenth centuries. Some discussion of the successor states after 1918. [3-0]
- 413 (6) Reformation Europe – An examination of European history, 1450-1650, which places both the Protestant Reformation and the Catholic Reformation in the broader context of the political, social, cultural, and economic changes during the early modern era. [2-1; 2-1]
- 415 (6) Early Modern Britain – A study of the social, economic, political, religious, cultural and intellectual history of Britain between the Reformation and the Industrial Revolution with special reference to the rise of modern industrial society.
- 419 (6) Victorian Britain – An examination of the social and cultural changes in Britain from the late eighteenth to the early twentieth century. Emphasis will be placed on the ways that institutions, families, social groupings, and reli-

- gious, aesthetic and other values responded to and influences the changes which produced the world's first industrial, urban society. [2-1; 2-1]
- 421 (12) Honours Tutorial [0-2; 0-2]
- 422 (6) Modern Japanese History Since 1800 – The building of a modern state, its crisis in the 1930's, and its postwar recovery; topics include business institutions, politics, imperialism, intellectual syncretism, social change, and Japan's growing influence in the world. (Same as ASIA 422.) [3-0; 3-0]
- 423 (6) Economic and Business History of Modern Japan – From 1800 to the present; emphasis on the business strategies of Japan's largest companies; attention also to broader economic topics such as international trade, government policy, social impact of industry, business and politics, labour, and post 1971 multi-nationalism. [3-0; 3-0]
- 425 (6) War and Society – Continuity and change in the relations of war and society, the connections between the economy, society, the military, and government in peacetime as well as war; not a course in military history. [3-0; 3-0]
- 426 (6) Twentieth-Century Canada – A survey of the political, social, and economic developments which have shaped contemporary Canada. [3-0; 3-0]
- 427 (3) Seminar in Native History of Canada. – Major interdisciplinary themes in the history of Canada's Aboriginal Peoples after European contact including historical demography, economic interdependency, missionary encounters, and relations with the Canadian state. (0-2)
- 428 (6) Intellectual History of the United States from the Colonial Period to the Present Day – Examines the evolution of the American mind from the Colonial period to the present, with and emphasis on patterns of thought that have developed in response to American conditions.
- 430 (6) Development of Canadian External Policy since Confederation – Examines the history of Canada's external relations since Confederation with particular emphasis on Canada's changing international status and role in the twentieth century. [3-0; 3-0]
- 431 (6) Population in History – Examines selected demographic themes in world-wide historical perspective, the history of the family, urbanization, overpopulation, population growth and industrialization, Malthusian theory, and related problems of Third World countries. [3-0; 3-0]
- 432 (6) International Relations of the Great Powers in the Twentieth Century – The international relations of the great powers from the end of the First World War to the end of the Cold War. [3-0; 3-0]
- 433 (6) Fourth-Year Honours Seminar [0-2; 0-2]
- 434 (6) History of Southeast Asia Since 1800 – The modern history of Vietnam, Laos, Cambodia, Thailand, Malaysia, Indonesia, and the Philippines. Special attention to the revolutions in Vietnam, and Indonesia. (Same as ASIA 434.) [3-0; 3-0]
- 435 (6) Communist Movements in Eastern Europe since 1900 – Emphasis on the smaller countries of the Communist orbit. Deals with the Soviet Union for background and for comparative perspectives. (Same as POLI 425.) [3-0; 3-0]
- 437 (6) The American Impact on Canada – An examination of the influence of the United States' rise to continental, hemispheric, and world power on Canada in the areas of economics, culture, defence, and foreign policy. [2-1; 2-1]
- 438 (6) History of the Soviet Union – The role of the Communist party, the evolution of Soviet society, the transformation of the Soviet economy, and the techniques of government under Lenin, Stalin, and Khrushchev. [2-1; 2-1]
- 441 (3) Anti-Semitism and Nation-Building – The Jewish experience from the end of the nineteenth century to the creation of the State of Israel. [3-0]
- 442 (3) Topics in Technology and Society in History. – The historical dimensions of current debates about technology, focusing on a single, interdisciplinary theme. (3-0)
- 444 (3) Slave Societies in the Americas – A comparative analysis of the institution of chattel slavery, its growth, its effects on slaves and masters, its relation to the larger society, and the causes of its decline, in the various cultures of the Americas. [2-1]
- 445 (3) American Foreign Policy, 1870-1945 – Selected topics in political and economic aspects of American foreign policy, from 1870 to 1945. [3-0]
- 446 (3) American Foreign Policy, 1945 to present – Selected topics in the history of American foreign policy, 1945 to the present. [3-0]
- 448 (3) Diplomacy and Conflict in the Middle East, 1948 to the Present – International relations in the Middle East, with special emphasis on the conflicts between Israel and her neighbours. [3-0]
- 449 (12) Honours Essay [0-2; 0-2]
- 450 (3/6) (d) Selected Topics in Latin American History – A study in depth of one major topic (such as the Cuban Revolution or Peronismo) in the recent history of Latin America. [3-0; 3-0]
- 451 (3) Selected Topics in the History of Brazil – Examines the formation of the largest, most populous nation in Latin America, the establishment and rapid growth of its industrial economy. [3-0]
- 452 (3) Selected Topics in the History of Mexico – Examines a major theme in Mexican history such as Spanish-Indian contact, church-state relations, Mexico's integration into the world economy, struggles for land and social justice, state formation, and the role of ritual, myth and cultural values in Mexican history. [3-0]
- 460 (6) Britain in the Twentieth Century – Changes in class structure; private vs. public education; decline of the imperial economy; impact of two world wars; impact of the depression; end of empire and its effects; racial conflict in Britain; nationalization of industry; balance of payments; the welfare state; entry into the Common Market. [2-1; 2-1]
- 470 (6) Seminar in Medieval History – Annually changing topics of medieval studies with special attention to research methods on primary sources. [0-2; 0-2]
- 475 (3) First Contacts in the Pacific. – An interdisciplinary history of early European contact with the Aboriginal Peoples of the northwest coast of North America and the Pacific Islands. (3-0)
- 480 (6) Economic and Social History of Modern China to 1949 – An examination of the effects of population pressure, agricultural and commercial growth, initial industrialization, urbanization, government policies, and popular rebellion upon family and kinship, voluntary associations, social stratification, migration and social practices in late imperial and republican China. [3-0; 3-0]
- 486 (3) Korea in the 20th Century – History of the Korean people in the 20th century; the traditional cultural history; Japanese colonial rule; the Korean war; the two Korean states; economic, social, and cultural change. [2-1]
- 490 (3) Seminar for History Majors – The course will explore selected problems and issues in the theory and practice of historical work. For seminar topics each year, consult the department. Open to majors with the permission of the department. [3-0]
- 500 (3) Readings in Canadian History – This course also lists as HIST 501-504.
- 505 (3) Seminar in Canadian History – This course also lists as HIST 506-509.
- 510 (3) Readings in American History – This course also lists as HIST 511-514.
- 515 (3) Seminar in American History – This course also lists as HIST 516-519.
- 520 (3) Readings in British History – This course also lists as HIST 521-524.
- 525 (3) Seminar in British History – This course also lists as HIST 526-529.
- 530 (3) Readings in Imperial-Commonwealth History – This course also lists as HIST 531 and 532.
- 533 (3) Seminar in Imperial-Commonwealth History – This course also lists as HIST 534.
- 535 (3) Readings in Medieval History – This course also lists as HIST 536 and 537.
- 538 (3) Seminar in Medieval History – This course also lists as HIST 539.
- 540 (3) Readings in Renaissance-Reformation History – This course also lists as HIST 541 and 542.
- 543 (3) Seminar in Renaissance-Reformation History – This course also lists as HIST 544.
- 545 (3) Philosophy of History and Canadian Historiography – Introduction to the philosophy of history and to the dominant themes in Canadian historical writing. This course normally is restricted to those students registered in the Master of Archival Studies program.
- 546 (3) Contemporary Canadian Historiography – Selected themes in contemporary Canadian historiography and upon the preparation of an historiographical evaluation of the literature in an area of particular interest to the individual student.
- 547 (3) Readings: Special Topics in History
- 548 (3) Historiography
- 549 (12) Master's Thesis
- 550 (3) Readings in French History – This course also lists as HIST 551 and 552.
- 553 (3) Seminar in French History – This course also lists as HIST 554.
- 555 (3) Readings in German History – This course also lists as HIST 556 and 557.
- 558 (3) Seminar in German History – This course also lists as HIST 559.
- 560 (3) Readings in Russian and East European History – This course also lists as HIST 561.
- 562 (3) Seminar in Russian and East European History – This course also lists as HIST 563.
- 564 (3) Readings in Modern European History – This course also lists as HIST 565 and 566.
- 567 (3) Seminar in Modern European History – This course also lists as HIST 568 and 569.
- 570 (3) Readings in Comparative Asian History
- 571 (3) d Readings in Chinese History – Also listed as HIST 586.
- 572 (3) d Readings in Japanese History – Also listed as HIST 592.
- 573 (3) Readings in Southeast Asian History
- 574 (3) Readings in South Asian History
- 575 (3) Seminar in Comparative Asian History
- 576 (3) d Seminar in Chinese History – Also listed as HIST 598.
- 577 (3) d Seminar in Japanese History – Also listed as HIST 599.
- 578 (3) Seminar in Southeast Asian History
- 579 (3) Seminar in South Asian History
- 580 (3) Readings in Intellectual History – This course also lists as HIST 581.
- 582 (3) Seminar in Latin American History
- 583 (3) Readings in Latin American History
- 584 (3) Readings in Economic and Social History – This course also lists as HIST 585.
- 587 (3) Readings in Diplomatic History – This course also lists as HIST 588.

- 589 (3) Seminar in Diplomatic History
- 590 (3) Readings in Ecclesiastical History – This course also lists as HIST 591.
- 593 (3) Readings in Military History – This course also lists as HIST 594.
- 595 (3) Oral History and Genealogy – Emphasis on research and collecting techniques. Review of existing programs concerned with collecting oral history. Admission limited to students in the Master of Archival Studies degree program, or in special cases by permission of the instructor.
- 596 (3) Readings in Comparative History – This course is also listed as History 597.
- 649 Ph.D. Thesis

History of Medicine and Science MEDH FACULTY OF MEDICINE

- MEDH 400 and 401 are elective courses in the Faculty of Medicine but are highly recommended for all Medical students who are not enrolled in special programs approved by the Faculty. They are also listed by the Department of History for credit in a History major, and are recommended humanities electives in the Faculty of Science.
- 400 (3) History of Medicine to the end of the Nineteenth Century – A study of the main ideas in medicine and health care from primitive times to the threshold of scientific medicine. Second term. Prerequisite: BIOL 101 or 102. [2-1-0; 0-0-0]
- 401 (3) History of the Health Sciences in the Twentieth Century – A study of the main developments in the health sciences in the modern era, including the social history of health care and the development of scientific health care. Second term. Prerequisite: BIOL 101 or 102. (Not offered 1993-94.) [0-0-0; 2-1-0]
- 501 (3/6) c History of Medicine – Course of directed study in topics selected by the students in consultation with the professor. (Not offered 1993-94.) [0-3-0; 0-3-0]

Home Economics HMEC SCHOOL OF FAMILY AND NUTRITIONAL SCIENCES, FACULTY OF AGRICULTURAL SCIENCES

- 100 (3) Introduction to Home Economics – Home Economics as a distinct field integrating knowledge from the social, physical, and biological sciences; relation to other helping professions. Limited to students of the HMEC Comprehensive or Specialization programs and in the Faculty of Education Home Economics Major and Concentration programs. [3-0]
- 300 (3) Elements of Professional Practice – Introduction to theories of practice; overview of appropriate means of delivering professional services for a variety of groups in different settings. Limited to students in the Dietetics and Home Economics programs. [2-3]
- 352 (3) Introductory Textile Science – Textile performance concepts. Interrelationships of fibres, yarns, fabric construction, dyes and finishes with a focus on consumer apparel and household textile products. Textile legislation. Prerequisite: CHEM 103. [3-0]
- 354 (3) Apparel Analysis and Assembly – An introduction to garment assembly including analysis of ready-to-wear apparel and garment industry techniques. [2-3]
- 356 (3) Consumer and Economic Aspects of Clothing and Textiles – The structure of the clothing and textiles industry from fibre to the consumer. The effect of government policies, legislation, the industry's production, and marketing practices on the family as consumers. Includes the implications of the retailing of fashion goods on patterns of family consumption. Prerequisite: ECON 100. [3-0]
- 360 (3) Design Fundamentals – Visual elements and principles of design, the nature of aesthetics and the influence of design on our physical environment. [2-3]

- 366 (3) Textile Design – Design, structures, and techniques of decorative textiles; influence of historic textiles on contemporary fabrics; textile design techniques of selected cultures. Prerequisite: HMEC 360. [1-3]
- 406 (3/6) d Home Economics Seminar – Current developments in selected areas of Home Economics. Open to third- and fourth-year students with permission of the instructor. [0-3]
- 450 (3) History of Costume – A survey of the aesthetic, economic, cultural, social, and political significance of costume in history from ancient Egypt to contemporary times. [3-0]
- 452 (3) Advanced Textile Science – A study of the molecular structure and chemical properties of fibres, including physical testing and assessment of textile performance. Prerequisite: HMEC 352. [2-3]
- 454 (3) Apparel Design I – Aesthetic theories and principles of garment design with a focus on the flat pattern method as used in the garment industry. Analysis of ready-to-wear techniques and garment assembly. Prerequisites: HMEC 354 and 360. [2-3]
- 456 (3) Apparel Design II – Emphasis on such design techniques as draping and tailoring. Further study of the fashion industry and prominent designers. Prerequisites: HMEC 354, 360 and 454, or permission of instructor. [2-3]
- 466 (3/6) d Special Problems in Home Economics – Current topics in a specific area of Home Economics, based on original laboratory or field research.
- 476 (3) Directed Study in Home Economics – Directed investigation of a problem, requiring a written or oral report of findings. Prerequisite: satisfactory standing and permission of faculty member supervising the investigation. Fourth-year Home Economics students only.

Home Economics Education HMED SEE CURRICULUM STUDIES, FACULTY OF EDUCATION

Human Kinetics HKIN SCHOOL OF HUMAN KINETICS, FACULTY OF EDUCATION

- 103 (3) Conditioning for Sport and Physical Activity – Physical fitness and exercise; conditioning methods, exercise techniques and fitness appraisal. [2-2]
- 110 (3) Analysis of Individual Sport and Dance Performance – Analysis and appreciation of movement patterns in sport and dance performance. [2-2]
- 161 (3) Social and Managerial Aspects of Leisure and Sport – An introductory examination of the political, economic and social basis of leisure and sport; concepts, theories and problems. [3-0]
- 163 (3) Biodynamics of Physical Activity – An introductory examination of the mechanical, anatomical and physiological bases of human physical performance. [3-0]
- 164 (3) Dynamics of Motor Skill Acquisition – An introductory examination of motor skill acquisition, the variables which influence the learning and performance of motor skills, and the relationship between skill acquisition and growth and development. [3-0]
- 200 (3) Analysing Performance in Team Sports – The role of analysis in developing effective team sport performance. [2-2]
- 252 (3) Contemporary Health Issues – Examination of health issues, relevant to contemporary lifestyle, physical activity, and careers in the health and fitness field. The development of skills in critical thinking and consumerism as they relate to health and fitness. Prerequisite: completion of First Year. [3-0]
- 261 (3) Leisure and Sport in Canadian Society – The Canadian leisure and sport delivery system and related policies. Prerequisite: HKIN 161. [3-0]
- 280 (3) The Rise of Modern Sport – Selected topics in the growth of modern sport from 1800 to the present, with an examination of developments in Britain, the United States, and Canada. Prerequisite: HKIN 161. [3-0]
- 281 (3) Sociological Aspects of Sport – Selected aspects of sport examined in relation to modern social structures and cultures. Prerequisites: HKIN 161. [3-0]
- 284 (3) Physical Growth and Motor Development – Characteristics of physical growth and motor development related to physical activity; factors affecting, and measurement of, physical growth and motor development. Prerequisite: HKIN 164. [3-0]
- 292 (3) Leisure and Sport Event Management – Issues and strategies of leisure and sport event management are examined. Prerequisite: HKIN 161. [3-0]
- 293 (3) Planning, Provision and Management of Facilities – Planning, provision and management of leisure and sport facilities including policies, funding, design and technological development. [3-0]
- 300 (3) An Introduction to Professional Studies in Physical Education – An introduction to the profession of physical education, including its evolution, the responsibilities of professionals in physical education, and the relationship between theory and practice. Prerequisite: completion of Second Year. [3-0]
- 303 (3) High Performance Conditioning in Physical Activity and Sport – Conditioning methods, exercise techniques and appraisal methods for fitness in high performance physical activity and sport. Prerequisites: HKIN 103, 390 and 391. [3-0]
- 310 (3/12) d Performance Analysis of Selected Individual Sports – Specific individual topics to be announced each year. Prerequisites: HKIN 110 and completion of First Year. [2-2]
- 320 (3/12) d Performance Analysis of Team Sports and Activities – Specific topics to be announced each year. Prerequisites: HKIN 200 and completion of First Year. [2-2]
- 340 (3) Popular Dance and Culture – A thematic approach to dance in varied socio-cultural contexts which focuses on style, celebration, identity, and gender. Prerequisite: HKIN 110. [3-0]
- 343 (3) Dance for Children – The development of dance from ages 3 to 12. Play, imagery and dance from representational to symbolic interpretation, assimilation of rhythm and movement patterns; the folk tradition; the growth of technical skill; fundamental elements of dance composition. Prerequisite: completion of First Year. [2-2]
- 353 (3) Human Body Composition – Examination of techniques for measuring the amounts of adipose tissue, muscle and bone in the body, and factors affecting body composition, with particular emphasis on physical activity. Prerequisite: completion of Second Year. [3-0]
- 355 (3/6) d Field Experience – Analytical observations and supervised professional practice in physical activity and leisure settings as required for each specific program of study. See Undergraduate Advising Centre for specific prerequisites for each section. Students must take the section relevant to their programs of study. Prerequisite: completion of Second Year. [1-0-2]
- 360 (3) International Perspectives on Leisure and Sport – Leisure and sport systems, policies and programs in selected countries. Prerequisite: HKIN 261 and completion of Second Year. [3-0]
- 361 (3) Introduction to Athletic Training – Recognition, prevention, and first aid treatment of common sports injuries. Laboratory sessions emphasize principles and techniques of basic protective taping and strapping. Prerequisites: HKIN 390 and 391. [2-2]
- 362 (3) Adapted Physical Activity – Adapted physical activity for disabled and handicapped people of all ages; developmental approach to programming, fieldwork. Prerequisite: completion of Second Year. [2-0-2]

- 363 (3) Mechanics and Kinetics – An introduction to the physical laws of nature and an interpretation of those laws as applied to human movement observed in athletic skills. An examination of the biomechanical systems of the human body with respect to forces developed. An analysis of various specific athletic performances and an introduction to the research tools of kinesiology. Prerequisite: HKIN 163. Pre- or corequisites: HKIN 390 and 391 or ANAT 390.
- 364 (3) Human Behaviour in Sport and Physical Activity – Current issues, research and practical considerations in the study of human behaviour associated with performance management and participant satisfaction in sport and physical activity. Prerequisites: HKIN 164 and completion of First Year. [3-0]
- 365 (3) Foundations of Coaching – Methods of athletic conditioning, planning the program, psychology of training and coaching, athletic evaluation. Prerequisite: completion of Second Year. [3-0]
- 366 (3) Movement Experiences for Young Children – The design and implementation of movement experiences for children in early childhood years. Prerequisite: completion of Second Year. [3-0]
- 367 (3) Leisure and Disabled Persons – Leisure opportunities and policy issues for disabled and mentally handicapped persons. Prerequisite: completion of Second Year. [3-0]
- 368 (3) Motor Skill Learning and Performance – The principles of motor skill acquisition, application to learning and instruction in sport and physical activity programs. Prerequisites: HKIN 164 and completion of First Year. [2-2]
- 369 (3) Instructional Analysis and Design in Sport and Physical Activity – Instructional design and technologies applied to sport and physical activity programs. Prerequisite: completion of Second Year. [2-2]
- 370 (3) Introduction to Measurement in Sport and Physical Activity – An introduction to the theory and practice of physical fitness appraisal, motor skill evaluation and test construction relative to sport and physical activity. Prerequisite: completion of Second Year. [2-2]
- 371 (3) Introduction to Statistics and Research Methodology – Descriptive statistics, norms, normal probability curve; concepts of correlation, reliability and validity; statistical inference. Principles of research methodologies used in the study of sport and physical activity. Prerequisite: HKIN 370. [3-0]
- 372 (3) Research Applications in Leisure and Sport Management – An introduction to research methodologies commonly used in social and managerial studies in leisure and sport. An emphasis will be placed on qualitative methods. Prerequisites: HKIN 281 and completion of Second Year. [3-0]
- 374 (3) Perspectives on Play – Play theories and behaviour. Prerequisite: HKIN 161. [3-0]
- 382 (3) Meaning and Values in Sport – An analysis of the experience of sports activities. Prerequisites: HKIN 261 and completion of Second Year. [3-0]
- 383 (3) The Olympic Games: Ancient and Modern Prerequisite: completion of Second Year. [3-0]
- 390 (3) Functional Anatomy and Applied Physiology I – Neuro-Muscular and Skeletal Systems – A study of the structure and function of the neuromuscular and skeletal systems of the human body. Special emphasis on movement analysis and the physiological effects of exercise on these systems. Prerequisite: HKIN 163. [2-2]
- 391 (3) Functional Anatomy and Applied Physiology II – Support Systems to Human Movement (Digestion, Endocrine, Urinary, Circulation, and Respiration) – A study of the structure and function of the systems of Digestion, Endocrine, Urinary, Circulation and Respiration. As well as the anatomy and physiology of these systems, special emphasis will be placed on exercise physiology. Prerequisite: HKIN 390. [2-2]
- 392 (3) The Leisure and Sport Industry – Economic and financial issues in the leisure and sport industry. Topics include entrepreneurship, economic impact, commercialization, patterns of ownership and control, and selected financial practices. Prerequisite: COMM 457. [3-0]
- 400 (3) Planning Physical Education, Sport and Exercise Programs – Processes, techniques and considerations in the planning, implementation and evaluation of physical education, sport and exercise programs in both public and private agencies. Prerequisite: completion of Second Year. [3-0]
- 420 (3/12) d Coaching Effectiveness in Selected Sports and Activities – Specific topics to be announced each year. Prerequisite: appropriate 300-level Performance Analysis course. [3-0]
- 448 (3/6) d Dance Choreography – Term 1: foundations of choreography; Term 2: (optional) advanced concepts in choreography for stage and film production. Prerequisite: HKIN 310A or HKIN 310B. [2-2; 2-2]
- 455 (15) Field Work and Field Research Practicum – Field work and a field research project will be undertaken concurrently in a cooperating leisure, sport or other agency over one term in fourth year (30 hours per week). Students will also attend weekly seminars to discuss field work and the field research projects. Prerequisites: Fourth Year standing, HKIN 371 or 372, and approval from Program Coordinator. Limited Enrollment.
- 456 (3) Directed Studies Abroad – A program of lectures, seminars, visits and directed study of selected topics on site in a foreign country. Prerequisite: Completion of Second Year.
- 461 (3) Prevention of Sports Injuries I – Training and safety strategies for the prevention of injuries to the musculoskeletal system and sense organs. Prerequisites: HKIN 361, 363, 390, 391. Corequisite: HKIN 463. [3-0]
- 462 (3) Skeletal Muscle Adaptability to Exercise and Fatigue – The mechanism(s) underlying skeletal muscle adaptation to physiological overloads as with physical activity will be discussed. The etiology of muscle fatigue resulting from exercise will be discussed in light of substrate supply, end-product accumulations and protein functions particularly at the cellular level. Prerequisites: HKIN 390, 391, 463. [3-0]
- 463 (3) Physiology of Exercise – Study of the acute and chronic effects of exercise on body systems; and relationship of the functional capacity of individual systems to maximal human performance. Prerequisites: HKIN 390 and 391 or ANAT 390 and BIOL 353. [2-2]
- 464 (3) Health Promotion and Physical Activity – Current perspectives on health promotion and health education; design and implementation of health promotion strategies in a variety of arenas, particularly health promotion/education strategies aimed at encouraging physical activity. Prerequisite: HKIN 252. [3-0]
- 467 (3) Physical Activity and Mentally Handicapped Persons – A developmental approach to physical activity programs for mentally handicapped people of all ages; fieldwork. Prerequisite: completion of Second Year. [2-0-2]
- 468 (3) Human Motor Performance – Acquisition, performance and control of skilled movements. Processes and underlying mechanisms involved in learning and performing motor skills. Prerequisite: completion of Second Year. [2-2]
- 469 (3) Exercise Prescription – Theory and methods of fitness appraisal and exercise prescription for normal and special populations. Pre- or corequisites: HKIN 370 and 463. [3-0]
- 471 (3) Prevention of Sports Injuries II – Training and safety strategies for the prevention of injuries or disorders of internal organs and central nervous system. Environmental and nutritional factors in conditioning and pre-event preparation. Prerequisite: HKIN 461. [3-0]
- 473 (3) Human Biomechanical Analysis – Advanced quantitative analysis of human motion. Prerequisite: 1st year Physics or HKIN 363. [3-0]
- 481 (3) Sport Marketing and Communication – A seminar on the application of social science theories and methods to sport marketing and communication. Prerequisite: COMM 465 or 396. [3-0]
- 489 (3/6) d Seminar – Current topics and research in specific areas. Prerequisite: completion of Third Year. [3-0; 3-0]
- 492 (3) Human Resource Development in Leisure and Sport Agency – Human resource development issues and strategies are examined in leisure and sport environments. Prerequisite: COMM 329. [3-0]
- 499 (3) Projects in Human Kinetics – Provides opportunities to perform research pertaining to a chosen area of human kinetics. Prerequisite: completion of Third Year and permission of Senior Faculty Adviser.
- 500 (3) Graduate Seminar
- 530 (3/6) d Directed Studies – Topics selected by the student, with the approval of the Graduate Advisor, can be studied under the supervision of a member of the faculty.
- 551 (3) Mathematical Applications in the Study of Sport and Physical Activity – A selection of topics from: Stochastic models applied to the study of motor learning, involvement in sport, socialization through sport, etc.; the assessment of change; analyses of scoring systems and playoff procedures used in various sports; game theory.
- 560 (3) Models of Sport Organization – An analysis and comparison of models of sport organization in selected countries.
- 562 (3) Bioenergetics of Physical Activity – Basic energy systems of the human body; primarily concentrating on the bioenergetics of the skeletal muscle cell, recovery from muscular work, substrate utilization, muscle fiber types, strength, endurance and the physiological assessment of maximal performance.
- 563 (3) Measurement of Human Motion – A critical evaluation of research tools used to measure and assess human motor performance including electromyography, anthropometry, ergometers, indirect calorimetry, cinematography, and indirect dynamics.
- 564 (3) Psycho-Social Aspects of Physical Activity – Selected psycho-social considerations in sport: initial and continuing involvement in the competitive sport environment.
- 565 (3) Physiological Aspects of Physical Activity – Survey of research regarding the physiological aspects of activity; the effects of altitude and environmental temperature on man's performance in exercise and sports.
- 567 (3) Human Motor Performance – Processes underlying the ability to learn and perform motor skills.
- 568 (3) Seminar in Human Motor Performance – Reports and discussions of research literature concerning theories and findings in human performance. Special emphasis is given to understanding the basic mechanisms underlying motor performance within the framework of man as a component system.
- 570 (3) Research Methods in Human Kinetics – Research methods applied to the study of sport and physical activity, the nature of scientific inquiry, the design of experiments, the survey as a research medium, the historical and philosophical methods of inquiry, the writing of the research report.
- 571 (3) Developmental and Adapted Physical Education – The theory and practice of adapted physical education. Programs of general class activities, special adapted physical education and recreation for the disabled, handicapped and aged. The laboratory period affords practical experience in individual and group methods for conducting developmental conditioning and corrective exercises.
- 573 (3) Seminar in Mechanical Analysis of Human Movement – An investigation of human movement using

- cinematographical and other research methods. The case study approach will be used to examine kinesiological concepts and principles.
- 574 (3) Seminar in Health Promotion Through Physical Activity – The relationship of new concepts in health to the promotion of health through physical activity; the application of research findings from a number of disciplines to the identification, selection, and targeting of health promotion/education strategies related to physical activity.
- 580 (3) Seminar in Current Problems in Human Kinetics – Objectives; programs; leadership; history and trends; professional status; community organizations and auspices; attitudes and philosophy.
- 581 (3) Sport, Leisure and Consumer Culture. – Sport and leisure are viewed in the context of theoretical debates about mass society and consumer culture.
- 582 (3) Seminar in Canadian Sport History – Selected topics in Canadian sport history; emphasis on the twentieth century
- 583 (3) Physical Education, Sport and Exercise Programs – The development of curricula, implementation and evaluation techniques in physical education, sport and exercise programs; relationships of programs in schools, community centres and other institutions.
- 584 (3) Physical Growth and Motor Development – The process of human physical growth and the relationship between growth/maturation and physical activity; sequential development of locomotor and manipulative skills and the application of critical period/optimal period literature to developmental skills.
- 585 (3) Coaching Science I – The application of research findings from exercise physiology, human growth and motor development, biomechanics and sport medicine, to the coaching of athletes.
- 586 (3) Coaching Science II – The application of research findings from sport psychology, sport sociology and human motor learning, to the coaching of athletes.
- 590 (3) Seminar in Research on Teaching in Physical Education – Development, methods and results of research on teaching physical education.
- 591 (3) Seminar in the Organizational Analysis of Leisure – Selected topics in organizational theory as applied to the analysis of leisure and sport organizations.
- 595 (0) Master's Major Paper
- 598 (3) Directed Field Studies in Sport and Physical Activity Agencies
- 599 (12) Master's Thesis
- 601 (3/12) c Doctoral Seminar
- 699 (0) Ph.D. Thesis
- 205 (3) Applied Human Nutrition – Evaluation and improvement of food habits and nutritional status in all stages of life; identification of problems connected with public health nutrition in Canada. Prerequisite: HUNU 203 or 209. [3-3]
- 209 (3) Nutrition – The function of nutrients in the body, the changes resulting from nutritional deficiencies, the distribution of nutrients in the diet, and the dietary requirements for various nutrients. Prerequisite: Chemistry 11; Chemistry 12 or CHEM 103 strongly recommended. [3-0]
- 211 (3) Perspectives in Nutrition – Introduction to the study of nutrition and its application to dietetic problems in a modern society. Prerequisite: at least one course in chemistry and one course in biology. Credit will not be granted for both HUNU 211 and either HUNU 203 or 205. [3-0]
- 301 (3) Consumer Aspects of Food – Economic, physiological, social, cultural, and environmental factors influencing food choices and consumption. Legislation governing food; food markets and merchandising techniques; criteria for food selection. Prerequisites: HUNU 201. [3-3]
- 303 (3) World Problems in Nutrition – Conceptualization and scientific analyses of global problems in food and nutrition. Complexities of food habits and malnutrition in various cultures around the world will be examined. [3-0]
- 305* (3) Macronutrients and Energy – Cellular and organismal features of nutrition with an emphasis on energy metabolism and on the biochemical and physiological roles of carbohydrates, lipids, and proteins in maintaining health and preventing disease. Credit cannot be obtained for both HUNU 203 and the combination of HUNU 305 and 307. Credit granted for only one of HUNU 305 and ANSC 322. Prerequisite or corequisite: BIOC 300 or 302 and BIOL 363. [3-0]
- 307* (3) Vitamins and Minerals – A continuation of HUNU 305 to include discussion of vitamins and minerals and their interrelations in metabolism. Prerequisite: HUNU 305. Credit will not be given for both HUNU 203 and the combination of HUNU 305 and 307. Credit granted for only one of HUNU 307 and ANSC 322. [3-0]
- 309* (3) Human Nutrition Laboratory – Characteristics of nutrients, including proteins, lipids, carbohydrates, vitamins, and minerals, and methods used to study their role in human nutrition. Prerequisite or corequisite: HUNU 305 and 307. Credit will not be given for both HUNU 309 and either ANSC 321 or 323. [0-3; 0-3]
- 321 (3) Food Service Systems – Planning, organization, and management of institutional food service including computer applications, and field trips to the community. Prerequisite: COMM 329. Not available for credit to students in the Faculty of Science. [3-3]
- 351 (3) Human Physical Growth and Development – A review of the field of Human Biology from the aspect of physical development, covering pre- and postnatal growth and development; and the concepts of maturation and aging. Emphasis will be placed on normal variations in these factors, and their consequences in the population. Not available to students in Home Economics. Not available for credit in the Faculty of Science. [3-0]
- 401 (3) Advanced Foods – Evaluation of foods for nutrient content and characteristics of acceptability. Variations of food selection with ethnic background and periods of the life span. Prerequisite: third- or fourth-year standing in Nutrition or Dietetics program or consent of instructor. [2-3]
- 403 (3/6; d) Selected Topics in Human Nutrition – A seminar on current developments in Human Nutrition. A different theme will be selected each year. B.Sc. Human Nutrition students may only receive 3 credits and B.Sc. (Dietetics) students may receive a maximum of 6 credits. [0-3]
- 407 (6) Nutrition and Disease – The role of nutrition in the prevention, etiology and treatment of disease in the light of known disease processes. Emphasis on the role of the dietitian as a member of the health care team and on the application of therapeutic diets. Prerequisites: HUNU 305 and 307. [3-3; 3-3]
- 409* (3) Developmental Nutrition – The influence of nutrition on growth and development of animals during prenatal and early postnatal life. The approach will be largely from the standpoint of the availability and utilization of nutrients for fetal and early postnatal metabolism, and the relationship between maternal and fetal nutrition. Prerequisites: HUNU 305 and 307. [3-0]
- 411 (3) Human Nutrition Over the Life Span – Nutritional requirements and dietary patterns of healthy individuals throughout the life span. Prerequisites: HUNU 305 and 307 or consent of instructor. [3-0]
- 419 (3) Assessment of Nutritional Status – The use of dietary, anthropometric, biochemical and related information for the assessment of nutritional status of individuals and populations. Laboratory assignments will demonstrate data collection and processing procedures, including computer processing of dietary and biochemical data. Prerequisites: HUNU 305 and 307. [2-3]
- 421 (3) Quantity Food Management – Management responsibilities in quantity food production with emphasis on menu planning, purchasing and service. Includes planning and equipping food service. Not available for credit to students in the Faculty of Science. [3-0]
- 449 (6) Honours Thesis
- 467 (3/6) d Special Problems in Human Nutrition – Current topics in a specific area of Human Nutrition, based on original laboratory or field research.
- 477 (3) Directed Study in Human Nutrition – Investigation of a problem, requiring a written or oral report of findings. Prerequisite: satisfactory standing and permission of faculty members supervising the investigation. Fourth-year Human Nutrition or Dietetics students only.
- 500 (3) Research Methods in Human Nutrition – Experimental design, methods of survey research, nutritional epidemiology, clinical research, and laboratory animal research. Issues such as animal models, ethics in animal and human research, statistical methods, and preparation of written reports and manuscripts, etc. will be addressed. Required of all graduate students in Human Nutrition. [3-0]
- 511 (2) Current topics in Protein and Amino Acid Nutrition – A combined lecture and seminar course dealing with recent advances in protein and amino acid nutrition. Alternate years. [2-0]
- 513 (2) Current Topics in Lipid Nutrition – A combined lecture and seminar course dealing with recent advances in lipid nutrition. Alternate years. [2-0]
- 515 (2) Current Topics in Vitamin Nutrition – A combined lecture and seminar course concerned with advanced topics in vitamin metabolism and function. Alternate years. [2-0]
- 517 (2) Current Topics in Mineral Metabolism – A combined lecture and seminar course dealing with recent advances in mineral and trace element metabolism. Alternate years. [2-0]
- 521 (3) Advanced Community Nutrition – Factors influencing food availability and consumption and resulting nutrition of health populations. Discussion periods will focus on legislation influencing food policy and on various public agencies which serve groups facing nutritional risk. Alternate years. Prerequisite: Permission of the instructor.
- 523 (3) Practicum in Community Nutrition – The planning, implementation, and evaluation of a representative nutrition program. Each student's project will be conducted under the auspices of a local health agency and will focus on a group facing potential nutritional risk. Alternate years. Prerequisite: HUNU 521.

Human Nutrition HUNU
SCHOOL OF FAMILY AND NUTRITIONAL SCIENCES,
FACULTY OF AGRICULTURAL SCIENCES

HUNU 209 may be taken for Arts credit as a List B (second year) elective and HUNU 303 and 351 may be taken for Arts credit as a 'course from another faculty or degree program' (see Faculty of Arts entry in this Calendar). Otherwise, HUNU courses may not be taken for Arts credit.

*Courses with science credit are followed by an asterisk.

- 201 (6) Food Theory and Applications – Composition, structure and properties of foods. Effect of physical and chemical environment. Laboratory work applies scientific principles and theories to practical problems of food preparation. The approach is both experimental and practical in nature. Prerequisites: CHEM 103 or 110 or 120, and BIOL 101 or 102. [3-3; 3-3]
- 203 (3) Introductory Nutrition – Principles of nutrition. Emphasis on the dietary sources of nutrients, their physiological availability and metabolic utilization for the prevention of specific nutritional diseases and maintenance

- 525 (3) Current Topics in Nutrition Education – Analysis and interpretation of current research. Techniques for planning, conducting and evaluating educational programs. Alternate years.
- 531 (2) Nutrition Seminar – Students or guests present seminars on current topics in nutrition. Required of all first-year graduate students in Human Nutrition. After the first year, graduate students are expected to attend without credit.
- 547 (2-6) c Directed Studies – In special cases, directed studies on certain aspects of nutrition may be arranged for graduate students in attendance.
- 549 (6/12) c M.Sc. Thesis
- 649 Ph.D. Thesis

Indonesian**SEE ASIAN STUDIES, FACULTY OF ARTS****Industrial Education****SEE CURRICULUM STUDIES, TECHNOLOGY STUDIES EDUCATION, FACULTY OF EDUCATION****Interdepartmental
FACULTY OF MEDICINE****INDE**

- 401 (4) Clinical Skills I – Principles of patient interviewing and introduction to physical examination of the normal individual. This course is graded on a pass/fail basis.
- 403 (1) Medical Ethics – Ethical issues in medical practice; physician's code of responsibility towards patients and society. This course is graded on a pass/fail basis.
- 421 (0) Clinical Skills II – Final examination in course administered by the Departments of Medicine, Surgery, Obstetrics/Gynaecology, Paediatrics and Psychiatry. Exam is an OSCE (Objective Structured Clinical Examination) and is graded on a pass/fail basis.
- 427 Addiction Medicine and Intercollegial Responsibility – Core knowledge and attitudes of addiction medicine.
- 450 (6) Directed Studies – Advanced study in an approved medically relevant basic science or clinical discipline. Electives for third year medical students. This course is graded on a pass/fail basis.
- 475 (3) Professional Dimensions in Medicine – Overview of ethics, jurisprudence, medical office procedures, physician well-being in relation to professional practice of medicine. Introduction to clinical procedures. This course is graded on a pass/fail basis.
- 477 Addiction Medicine and Intercollegial Responsibility – This course is integrated throughout the four years of the medical program to prepare students to diagnose and treat substance use disorders in patients, families and colleagues. Final course evaluation in fourth year.

Interdisciplinary**FACULTY OF GRADUATE STUDIES****INDS**

- 501 (0) Instructional Skills Workshop. – Introduction to concepts and practice in higher education instruction; emphasis on lesson planning, student participation and instructional aides; includes video-taped practice teacher/peer feedback. 28 classroom hours.
- 502 (1-6) d Interdisciplinary Themes. – Seminars, lectures and discussions of subject matter involving several Faculties.
- 549 (6/12) c Master's Thesis
- 649 Ph.D. Thesis

Italian**DEPARTMENT OF HISPANIC AND ITALIAN STUDIES, FACULTY OF ARTS****ITAL**

Students with Italian 11 or 12 should consult the Department for placement in appropriate courses.

- 100 (6) First-Year Italian – Grammar, reading, and oral practice for beginners. [4-0; 4-0]

- 101 (6) First-Year Italian – Grammar, reading, composition, and oral practice for beginners with previous exposure to Italian or any Italian dialect. [4-0; 4-0]
- 105 (12) Intensive Italian – An accelerated course. Grammar, reading, composition, with special emphasis on the spoken language. This course is equivalent to ITAL 100 and 200. [6-0; 6-0]
- 200 (6) Second-Year Italian – Reading, writing, and oral practice, with constant and systematic reference to the grammatical structure of the language. Prerequisite: ITAL 100 or permission of the Department. [4-0; 4-0]
- 201 (6) Second-Year Italian – Intermediate grammar, reading, and composition. Prerequisite: ITAL 101 or permission of the Department. [4-0; 4-0]
- 300 (6) Advanced Composition, Translation, and Stylistics [3-0; 3-0]
- 302 (6) Introduction to Italian for Senior Students – An intensive course aiming to impart a reasonable degree of proficiency in spoken and written Italian. Basic grammar, conversation, progressive reading of literary texts. Prerequisite: proficiency in another Romance language or Latin. [3-0; 3-0]
- 303 (6) Italian Literature from the Origins to the Romantic Period – A thematic approach to Italian literary works considered in a broad cultural context. Alternates with ITAL 304. [3-0; 3-0]
- 304 (6) Italian Literature from the end of the Romantic Period to the 1960s – The development of modern Italian literature against the background of social and historical events. Alternates with ITAL 303. [3-0; 3-0]
- 400 (6) Advanced Studies in Italian Language and Style – Intensive training in translation and free composition with special emphasis on the stylistic analysis of literary texts. [3-0; 3-0]
- 401 (3/6) d Italian Literature of the Middle Ages – Dante, Petrarch, Boccaccio, and the minor lyric poets. (3-0) or [3-0; 3-0]
- 405 (3/6) d Topics in the Literature of the Italian Renaissance – The topics in any year may be selected from the following: Italian Humanism; Machiavelli and Ariosto; Tasso and the Literature of the Late Renaissance; Italian Renaissance Drama. [3-0] or [3-0; 3-0]
- 407 (3/6) d Topics in Italian Literature: Romanticism – The topics in any year may be selected from the following: the Romantic debate; neoclassic and Romantic poetry; Manzoni and the novel; literature of the Risorgimento. [3-0] or [3-0; 3-0]
- 408 (3/6) d Topics in Modern and Contemporary Italian Literature – The topics in any year may be selected from the following: from "Neo-realismo" to the "Avant-garde"; Croce's role in the poetics of twentieth-century Italian literature; Carducci, Pascoli, D'Annunzio, and the crisis of poetical language; the evolution of the modern Italian novel; Verga, Tozzi, Pirandello, Svevo, etc.; Pirandello and the revolution of Italian drama; Italian poetry of the twentieth century; from Gozzano to Montale. [3-0] or [3-0; 3-0]
- 420 (3/12) d Special Topics in Italian Language and Literature – A maximum of six credits is available in any one topic.
- 449 (6/12) c Honours Essay
- 501 (3/6) d Dante: The Minor Works
- 502 (3/6) d Dante: The Divine Comedy
- 505 (3/6) d Studies in the Literature of the Renaissance
- 507 (3/6) d Studies in Romanticism
- 508 (3/6) d Studies in Modern Italian Literature
- 515 (3/6) d Topics in Italian Language
- 520 (3/12) d Italian Language and Literature – A maximum of six credits is available in any one topic.
- 548 (0) Major Essay
- 549 (6/12) c Master's Thesis

Italian Studies**ITST****DEPARTMENT OF HISPANIC AND ITALIAN STUDIES, FACULTY OF ARTS**

- 310 (3/6) d The Divine Comedy in Translation [3-0] or [3-0; 3-0]
- 330 (3/6) d Introduction to Italian Civilization – The development of Italian culture from its origins to the present. In English. [3-0] or [3-0; 3-0]
- 421 (3/6) d Special Topics in Italian Studies. [3-0] or [3-0; 3-0]
- 431 (3/6) d Literature of the Italian Renaissance in Translation [3-0] or [3-0; 3-0]
- 432 (3/6) d Twentieth-Century Italian Film and Literature (in translation) [3-0] or [3-0; 3-0]

Japanese**JAPN****SEE ASIAN STUDIES, FACULTY OF ARTS****Korean****KORN****SEE ASIAN STUDIES, FACULTY OF ARTS****Landscape Architecture****LARC****FACULTY OF AGRICULTURAL SCIENCES**

**Additional fees are charged for these courses. See Index "Fees - Special Fees"

- 199** (1) Introductory Workshop – An introduction to landscape architecture immersing the student in a variety of design and landscape issues related to selected local environments. All incoming students are required to attend this late summer workshop prior to enrolling in their first-year LARC courses. Restricted to B.L.A. students.
- 205 (6) Introduction to Landscape Design I – This studio is concerned with design thinking and drawing and the creation of landscape space using landform, plants and landscape structures to create meaningful and useful outdoor places. Restricted to B.L.A. students. [2-7; 0-0]
- 206 (6) Introduction to Landscape Design II – This studio concentrates on the modes of thought used by landscape architects for determining the best use and final form for a site using quantitative and qualitative methodologies. Prerequisite: LARC 205. [0-0; 2-7]
- 220 (3) Landscape Architectural History – History, principles and theory of landscape architecture in Europe, Asia and America from antiquity to the present day. The influence of cultural attitudes and societal change upon the natural environment, town planning and design. Open to non-landscape architecture students with permission of the instructor. [3-0; 0-0]
- 221 (3) Introduction to Landscape Architecture: Landscape Architecture, Nature, and Society – Using case studies, the discipline's various activities as well as ideas about landscape meaning and function are explored. Open to non-B.L.A. students. [3-0; 0-0]
- 251 (3) Introduction to Landscape Technology – Studies and exercises using the project method in the technology of landscape architecture. The language and techniques of the landscape architect, elementary surveying, manipulation of land forms, grading, drainage and the preparation and interpretation of plans. Restricted to B.L.A. students. [0-0; 2-3]
- 254 (1) Professional Practice I – This course introduces the legal, economic, political, and ethical context within which the activity of changing the landscape occurs. Open to non-B.L.A. students with permission of the instructor. [0-0; 1-0]
- 305 (6) Intermediate Design I – Students apply the models, methods, and precedents of sustainability to a series of urban design, site planning, landscape management, and multiple-use projects. Prerequisite LARC 206 [2-7; 0-0]
- 306 (6) Intermediate Design II – Principles and skills gained in LARC 305 are applied first at the intermediate scale and then at the large scale of the region. Open space systems are studied and designed. Prerequisite: LARC 305. [0-0; 2-7]

- 320 (3) Design Thinking – The study of design methods and theories including types of design knowledge, idea generation, visual-visual and verbal-visual transformations, design programming, and project evaluation methods. Open to non-landscape architecture students with permission of the instructor. [2-2; 0-0]
- 340 (3) Visual Resource Management – Study of the theory, practice and history of visual resource management. Covers methodologies for analysis, planning, design and management of the visual landscape; legislative and public agency guidelines; operational policies of resource extraction industries; and the implication in multiple-use land management. Specific case studies are examined and problems in visual resource management are undertaken by the student. (Same as FRST 490.) [2-2; 0-0]
- 351 (3) Structures and Materials – The theory and principles involved in the construction of landscape elements. The use and properties of construction materials. Exercises will involve the detailing of landscape elements and the development of construction drawings. Prerequisite: LARC 251. [0-0; 2-3]
- 355 (3) Introduction to Computers in Landscape Architecture – Introduction to DOS and the use and application of various computer-aided Design and Geographic Information System programs for design and planning issues in landscape architecture. Open to non-landscape architecture students with permission of the Program Director. [1-4; 0-0]
- 405 (6) Advanced Landscape Design – Students explore the design of the urban landscape from both a cultural and ecological perspective. Students use physical and cultural informants present in the landscape to guide their designs for new communities. Prerequisite: LARC 306. [2-7; 0-0]
- 420 (3) Theories in Experience and Place – An advanced course in the exploration of design knowledge focusing on the examination of place and the systems, attitudes and ideas that influence the design of place. Open to non-landscape architecture students with permission of the instructor. [2-2; 0-0]
- 430 (3/6) c Directed Studies in Analysis and Programming – Restricted to third and fourth year undergraduate students and graduate students. Note: No more than six credits of directed studies will be counted towards the requirements for a B.L.A. degree.
- 431 (3/6) c Directed Studies in Design Theory – Restricted to third and fourth year undergraduate students and graduate students. Note: No more than six credits of directed studies will be counted towards the requirements for a B.L.A. degree.
- 440 (3) Landscape Planning – Examines in lecture and by case study the ecological, recreational, and resource concerns related to the design-planning of the larger landscape. Restricted to students with a design-planning background and study focus, with permission of the instructor. [2-3; 0-0]
- 451 (3) Advanced Landscape Technology – Study of advanced theories in landscape technology. Emphasis is placed on the resolution of multiple technical issues using case study sites and the development of comprehensive contract drawings necessary to implement planning and design solutions. Prerequisite: LARC 351. [2-3; 0-0]
- 454 (3) Professional Practice II – An extensive review of the practice of landscape architecture in Canada using case studies and precedents to explore the specific ethical and legal responsibilities of the landscape architect to the client, the public and the profession. Open to non-B.L.A. students with the approval of the instructor. [0-0; 3-2]
- 499 (6) Research Project – The project is usually undertaken over the two terms of the fourth year and, in some cases, over the preceding summer. Students must consult a Faculty Adviser prior to the end of classes in the third year. Approval for the project must be obtained from the Director of the Landscape Architecture Program and the Head of the Department before its initiation, and in any event, not later than October 1.
- 500 (0) Landscape Architecture Seminar – A forum for the exchange of ideas and the presentation of papers by faculty, students, and visitors.
- 510 (3/6) d Advanced Studies in Landscape Architecture – Problems in landscape architecture involving field investigation, emphasizing the changing landscape and our role in protecting, preserving and upgrading the environment through site design and landscape planning.
- 520 (3) Advanced Design Methods and Theories – Design learning, place theory, the relationship of theory and practice, design criticism, design typologies and other aspects of design thinking; discussed in the context of society's current design/planning activities. Prerequisites: LARC 320 and 420, or equivalent. Open to non-landscape architecture students with permission of the instructor.
- 540 (3) Environmental Analysis for Site Planning – Environmental parameters relevant to site planning and design for urban, rural, forest and wildland settings. Prerequisites: LARC 301 and 440, or equivalent. Open to non-landscape architecture students with permission of Instructor.
- 550 (3/6) d Directed Studies
- 599 (12) Master's Thesis
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- Language Education**
DEPARTMENT OF LANGUAGE EDUCATION,
FACULTY OF EDUCATION
-
- English Education** **ENED**
- 320 (2) Curriculum and Instruction in Language Arts: Elementary – Curriculum organization in language arts; principles and methods of instruction applied to teaching language arts. Prerequisite: READ 310. [0-0; 1-2]
- 449 (3/6) c Supervised Study – Investigation of a particular problem in ENED. Supervised by a faculty member chosen by the student. Agreement of supervisor and approval of the Head required.
- 508 (3/6) d Theory and Research in English Language Education
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
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- Language Education** **LANE**
- 206 (4-6) d Language Field Experience – Guided individual and group projects related to concurrent studies. Field-based assignments related to language study. Corequisite: LANE 226.
- 226 (3/6) d Introduction to Language Across the Curriculum – Understanding text structure within, and language diversity among, subject areas. Analysis of oral and written language from various curriculum areas in which English is the medium of instruction; implications for learning and instruction. (1.5-3) or (1.5-3; 1.5-3)
- 313 (4) Curriculum and Instruction in Theatre: Secondary – Curriculum organization in theatre; principles and methods of instruction applied to teaching theatre. Prerequisite: a completed concentration in theatre or permission of the Head. Corequisite EDUC 311. [2-4]
- 314 (4) Curriculum and Instruction in English: Secondary – Curriculum organization in English; principles and methods of instruction applied to teaching English. Prerequisite: a completed concentration in English or permission of the Head. Corequisite EDUC 311. [2-4]
- 333 (3) Primary Drama – A practical and theoretical study of the role of dramatic play in young children's education; principles and methods of instruction applied to teaching drama in kindergarten to grade 3; the application of drama to learning in the primary curriculum. (Credit may not be obtained for both ENED 333 and 335.) [3-0]
- 334 (3) Intermediate Drama – A practical and theoretical study of the use of drama in grades 4-7 as both a medium of instruction and a performance art. The application of drama to learning across the intermediate curriculum. (Credit may not be obtained for both ENED 334 and 335.) [3-0]
- 335 (6) Drama in Education – A practical and theoretical study of educational drama involving improvisation, creative movement, role-playing and participatory drama. The application of drama to learning across the school curriculum. (Credit may not be obtained for both ENED 335 and THTR 301.) [2-2; 2-2]
- 337 (3) Remedial Instruction in the Language Arts – Instructional principles, materials and methods for teaching students whose literacy achievement is at a low level. [3-0]
- 338 (3) Teaching Written Composition – Principles and practices in the teaching of written composition in all subject areas in elementary and secondary schools. [3-0]
- 340 (3) Using Canadian Children's Literature in the Classroom – Canadian children's literature, both English and French (in translation), appropriate for use in schools; methods of using the cultural elements of such literature. Credit will be given for only one of ENED 340 and MLED 340. [3-0]
- 341 (3) Introduction to Teaching Children's Literature – Methods of teaching literature to children. The appraisal of books and authors for children. [3-0]
- 342 (3) Trends and Issues in Teaching Children's Literature – Controversial issues and new directions in children's literature. Prerequisite: LANE 341. [3-0]
- 343 (3) Teaching Folklore in the Elementary Classroom – The role of folklore in language acquisition, psychological development, story patterning, imagination development, awareness of literary motifs, and appreciation of Canadian cultural heritage. Prerequisite: LANE 341. [3-0]
- 344 (3) Multicultural Children's Literature in the Elementary Classroom – Using children's literature of various cultures in Canadian schools; implications for instruction. Prerequisite: LANE 341. [3-0]
- 345 (3) Poetry in Education – The educational role of poetry in the development of language and imagination. Implications for instruction. [3-0]
- 346 (3) Teaching with Illustrated Materials – Various approaches to classroom use of visual representations of fiction and non-fiction for young people, K-12. Prerequisite: LANE 341 or 349. [3-0]
- 349 (3) Teaching Literature for the Adolescent – Characteristics of literature written for and of special interest to adolescents, relevant research, and implications for instruction. [3-0]
- 360 (3) Language, Education and Gender – Investigation of connections between issues of gender and the six strands of language education: reading, writing, speaking, listening, viewing and representing. [3-0]
- 379 (3) The Education of Immigrant Students – An examination of the cultural backgrounds of major ethnic groups. Instructional techniques for meeting the needs of immigrant students in the regular classroom with respect to culture and language. [3-0]
- 382 (3) School Library Resource Centre Programs – Strategies for workshop presentations, effective communication and cooperative programs. [3-0]
- 389 (3) Resource-Based Teaching – Principles and practices of teachers and teacher-librarians planning and teaching the curriculum using the resources of the school library resource centre. [3-0]
- 416 (3/6) c Advanced Speech Communication – The principles, aims, and components of various types of oral communication such as conversation, group discussion, oral

- interpretation, choral speaking, story telling, and public speaking in instructional settings. Not all topics will be studied each term. [2-1]
- 426 (4) Language Across the Curriculum: Secondary – Understanding the demands of the language diversity of the classroom and of the subject areas within the secondary school curriculum. Analysis of oral and written language from various curriculum areas; implications for learning and instruction. [2-4]
- 435 (6) Advanced Studies in Drama-in-Education – Recent advances in the uses of drama as a medium of learning and in the development of classroom programs. Laboratory experiences in role drama. Prerequisite: LANE 333, 334 or 335. [2-2; 2-2]
- 477 (3/6) d Special Topics in English Education. – Study of selected topics in English Education.
- 478 (6) Introduction to Teaching English as a Second Language – The application of linguistic insights to the effective teaching of English as a second language. Methods of teaching, Practice teaching. Prerequisite: one of LANE 489, ENGL 329, LING 200, 420. Prerequisite must have been taken within the last five years or may be corequisite with consent of instructor. [3-2; 3-2]
- 480 (3/6) c Advanced Studies in Language Education – Topics will be selected from creative expression, poetry-writing, appreciation, reading, grammar, spelling, and other areas related to English Language Education. Credit will be given for only 6 credits of LANE 480 and MLED 480. [3-0]
- 481 (3) Integrating Computers in Language Arts Programs – Applications of computers and associated information technologies to support pupil learning of the language arts in primary and intermediate programs, including the selection and management of software for computer-assisted learning, written expression. Prerequisite: CSED 402 or experience with computers. [3-0]
- 486 (3) Oral Language Development – Classroom activities for extending children's ability to express themselves orally. Diagnostic and remedial procedures for children with limited language competence. [3-0]
- 489 (6) Applied Linguistics for Teachers – Basic theories of linguistics and their application to classroom practice. [3-0; 3-0]
- 500 (3/6) c Research in Teaching of Children's Literature, K-1 – Theory and research in teaching children's literature with application to elementary and secondary methodology and curriculum development. The place of children's literature in school curricula.
- 534 (6) Theory and Research in Teaching Written Composition – Implications for teaching; the relationship of written composition to other aspects of the English program. For graduate students with experience in teaching English in elementary, secondary, or post-secondary institutions.
- 543 (6) Theory and Research in Teaching English as a Second Language – Critical examination of theories and research in current educational practices in English as a second language/English as a foreign language. Implications for teaching in elementary, secondary and post-secondary institutions. Prerequisite: LANE 478 and a senior course in linguistics.
- 550 (6) The Application of Theories of Second Language Acquisition – Pedagogical implications of language acquisition theories such as sequential vs. simultaneous acquisition, the optimal age hypothesis, pidginization, and the identity hypothesis. Prerequisite: LING 350 or equivalent course in Linguistics.
- 561 (3/12) c Laboratory Practicum
- 588 (3/6) d Seminar in Child Language in Education – Curricular and instructional applications of theory and research in child language studies. Prerequisite: LING 350 and senior course work in verbal learning or human development.
- 589 (3) Theory and Research in Early Literacy – Theories and research relevant to early literacy development. Implications for curriculum in the language arts, instruction and evaluation.
- 590 (3) Graduating Paper. – (Previously ENED 590).
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 601 (3-12) d Doctoral Seminar
- 699 Doctoral Thesis
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- Modern Language Education MLED**
- 311 (2) Curriculum and Instruction in Chinese: Secondary – Curriculum organization in Chinese; principles and methods of instruction applied to teaching Chinese. Prerequisite: a completed concentration in Chinese or permission of the Head; co-requisite EDUC 311. [1-2]
- 312 (4) Curriculum and Instruction in French: Secondary – Curriculum organization in French; principles and methods of instruction applied to teaching French. Prerequisite: a completed concentration in French or permission of the Head; co-requisite EDUC 311. [2-4]
- 313 (2) Curriculum and Instruction in German: Secondary – Curriculum organization in German; principles and methods of instruction applied to teaching German. Prerequisite: a completed concentration in German or permission of the Head; co-requisite EDUC 311. [1-2]
- 314 (2) Curriculum and Instruction in Italian: Secondary – Curriculum organization in Italian; principles and methods of instruction applied to teaching Italian. Prerequisite: a completed concentration in Italian or permission of the Head; co-requisite EDUC 311. [1-2]
- 315 (2) Curriculum and Instruction in Japanese: Secondary – Curriculum organization in Japanese; principles and methods of instruction applied to teaching Japanese. Prerequisite: a completed concentration in Japanese or permission of the Head; co-requisite EDUC 311. [1-2]
- 316 (2) Curriculum and Instruction in Russian: Secondary – Curriculum organization in Russian; principles and methods of instruction applied to teaching Russian. Prerequisite: a completed concentration in Russian or permission of the Head; co-requisite EDUC 311. [1-2]
- 317 (2) Curriculum and Instruction in Spanish: Secondary – Curriculum organization in Spanish; principles and methods of instruction applied to teaching Spanish. Prerequisite: a completed concentration in Spanish or permission of the Head; co-requisite EDUC 311. [1-2]
- 318 (2) Curriculum and Instruction in Modern Languages: Secondary – Curriculum organization in Modern Languages; principles and methods of instruction applied to teaching Modern Languages. Prerequisite: a completed concentration in Chinese, German, Italian, Japanese, Russian, or Spanish or permission of the Head; co-requisite EDUC 311. [1-2]
- 340 (3) Using Canadian Children's Literature in the Classroom – Canadian children's literature, both French and English (in translation), appropriate for use in schools; methods of using the cultural elements of such literature. Taught in French. Credit will be given for only one of LANE 340 and MLED 340. [3-0]
- 393 (3/6) d Teaching French in Elementary Schools – Strategies, techniques, and materials for and administration of Elementary French core programs. Prerequisite: FREN 202, 220, or approval of advisers in Modern Languages Education. [3-0]
- 394 (3/6) d Teaching French in French Immersion Schools – Strategies, techniques, and materials for and administration of French Language Immersion Programs. Prerequisite: FREN 202 or 220, and satisfactory performance in oral and written French proficiency tests. [3-0]
- 396 (3) Principles and Practice of French Program Development – The development and practice of French Immersion, Program Cadre, and French as a Second Language Programs for preschool, elementary, secondary, or adult groups. Prerequisite: One course in methodology of teaching French and one year of experience in teaching French. [3-0]
- 449 (3/6) c Supervised Studies – Investigation of a particular problem in Modern Languages Education. Supervised by a faculty member chosen by the student. Agreement of supervisor and approval of the Head required.
- 480 (3/6) c Advanced Studies in Language Education – Topics will be selected from creative expression, poetry-writing, appreciation, reading, grammar, spelling, and other areas related to French Language Education. Taught in French. Credit will be given for only 6 credits of LANE 480 and MLED 480. [3-0]
- 489 (3) Applied Linguistics for Teachers of French – Pedagogical applications of some descriptions of French. The organization of learning activities based on theories of language acquisition. Prerequisite: FREN 202 and 220. [3-0]
- 508 (3/6) d Theory and Research in Teaching of Modern Languages
- 561 (3/12) c Laboratory Practicum.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 575 (3) Bilingual Education: Theory and Practice – Theoretical and practical dimensions of bilingual education with specific reference to French language education in Canada.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis.
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- Reading Education READ**
- 310 (3) Introduction to Elementary Reading and Language Arts Instruction – Curricula, methods, materials, and evaluation in the teaching of Reading and Language Arts. Corequisites: EDUC 310 and 315
- 320 (2) Curriculum and Instruction in Reading: Elementary – Curriculum organization in reading; principles and methods of instruction applied to teaching reading. Prerequisite: READ 310. [0-0; 1-2]
- 391 (3) Theory and Practice in Reading Instruction – Theoretical foundations of reading instruction and methods which relate to the theories. [3-0]
- 392 (3) Trends and Issues in Reading Instruction – New trends in reading instruction and curricula and issues relating to these theories. Prerequisite: READ 391 or 310 and 320. [3-0]
- 449 (3/6) c Supervised Study – Investigation of a particular problem in Reading Education. Supervised by a faculty member chosen by the student. Agreement of supervisor and approval of the Head required.
- 472 (3) Reading in the Content Areas – Reading instruction; implications for teaching intermediate and secondary school subjects. [3-0]
- 473 (3) Materials of Reading Instruction – Analysis and evaluation of materials for reading instruction with special emphasis on the materials for use in British Columbia. Prerequisite: READ 310 and 320 (formerly READ 305), or 391. [3-0]
- 474 (3) Reading in the Secondary School Classroom: Theoretical Principles – The reading process as it relates to the teaching of secondary-school subjects: instructional planning, evaluation, motivation, development of interests, school program development. Prerequisite: READ 472. [3-0]
- 475 (3) Corrective Reading – Identification and instruction of children needing corrective teaching in reading in the regular classroom. Intensive laboratory practicum. Pre-

- requisite: READ 310 and 320 (formerly READ 305), or 391. [2-2]
- 476 (3/6) Remedial Reading – Individual diagnosis and treatment of reading difficulties. Intensive laboratory practicum. Prerequisite: READ 310 and 320 (formerly READ 305), or 391; and at least one school year of teaching experience. [2-4; 2-2]
- 477 (3/6) d Special Topics in Reading – In-depth study of selected topics in reading. Prerequisite: READ 310 and 320 (formerly READ 305), or 391. [3-0]
- 508 (3/6) c Review of Reading Research – Examines a variety of research questions and methodologies in the field of reading education. Considers historical trends and issues in reading research.
- 544 (3) Theoretical Bases for Reading Research and Practice – Examines the contributions of cognitive psychology, psycholinguistics, sociolinguistics, linguistics and education to the understanding of reading processes and pedagogy. Prerequisite: READ 310 and 320 (formerly READ 305), 391 or 472.
- 545 (3) Theoretical Foundations of ESL/EFL Reading Pedagogy – Reading theories and methodologies appropriate for the design of English as a Second Language/English as a Foreign Language. Prerequisite: a three-credit course in linguistics and a three-credit course in reading education.
- 560 (3/6) d Assessment in Reading and Other Language Arts – Techniques in the assessment and teaching of severe reading difficulties and/or difficulties in spelling, writing, and oral language. READ 561 must be taken concurrently. Prerequisite: READ 476, or permission of the instructor.
- 561 (2) Practicum in Assessment in Reading and Other Languages – Intensive laboratory practicum. To be taken along with READ 560.
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 574 (6) Supervision of Reading – Curriculum analysis and planning. Implications for the administrator, the consultant and supervisor of reading.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
- 601 (3/12) d Doctoral Seminar
- 699 Doctoral Thesis
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- Teacher Librarianship** **LIBE**
- 381 (3) Administration of the School Library Resource Centre – The role, philosophy, and management of school library resource centres in elementary and secondary schools. [3-0; 0-0]
- 383 (3) Selection of Learning Resources I – Basic principles of selecting learning resources to support the instructional program in the school. [3-0]
- 384 (3) Selection of Learning Resources II – An in-depth analysis of selection criteria for curriculum-related resources. Prerequisite: LIBE 383. [3-0]
- 385 (3) Organization of Learning Resources – The organization, classification, and cataloguing of school library resource centre materials. [3-0]
- 386 (3) Classification and Cataloguing of Learning Resources – Advanced organization of learning resources including computer applications of original cataloguing. Prerequisite: LIBE 385. [3-0]
- 387 (3) Information Services I – Basic principles of the reference process and types of resources used in school library resource centres. [3-0]
- 388 (3) Information Services II – Recent developments in access to information retrieval and their implications for the instructional process. Prerequisite: LIBE 387. [0-0; 3-0]
- 449 (3/6) c Supervised Study – Investigation of a particular problem in Library Education. Supervised by a faculty member chosen by the student. Agreement of supervisor and approval of the Head required.
- 477 (3/6) d Special Topics in Teacher Librarianship – In-depth study of selected topics in library education. [3-0]
- 508 (3/6) d Theory and Research in Teacher Librarianship
- 527 (3/6) d Seminar in Teacher Librarianship – Research and its application for school library resource centres.
- 561 (3/12) c Laboratory Practicum
- 565 (3/6) d Special Course in Subject Matter Field – Courses in various subject matter fields designed to bring teachers up to date in recent findings in each field.
- 580 (3/12) c Problems in Education – Investigation and report of a problem.
- 590 (3) Graduating Paper.
- 598 (3/12) c Field Experiences – For those on Master's, Doctoral and Diploma Programs.
- 599 (6/12) c Master's Thesis
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- Latin** **LATN**
DEPARTMENT OF CLASSICS, FACULTY OF ARTS
- Students with any high school Latin who wish to pursue the study of Latin further should consult the Department of Classics.
- 100 (6) First-Year Latin – For students with no previous knowledge of Latin. [3-0; 3-0]
- 200 (6) Second-Year Latin Prerequisite: LATN 100. [3-0; 3-0]
- 300 (6) Introduction to Latin for Senior Students – An intensive course in the fundamentals of Latin grammar and syntax. Designed for students who need to acquire a knowledge of basic Latin in one year for background in their own discipline or who plan to proceed to Latin 305. Not for credit towards a Major or Honours degree in Classics. Students may not receive credit for both LATN 100 and 300. [3-0; 3-0]
- 301 (6) Latin Literature of the Classical Period – Readings in the major Latin authors in prose and verse. Prerequisite: Latin 12 or LATN 200. [3-0; 3-0]
- 305 (6) Medieval Latin – Introduction to Medieval Latin language and literature. Development of a reading knowledge of Medieval Latin through selections from major authors and genres after 400 A.D. Latin Major and Honours students require special approval of the departmental adviser. (Same as RELG 320). Prerequisite or corequisite: LATN 200 or 300. [3-0; 3-0]
- 411 (3) Roman Historians, I. – Livy. Prerequisite: LATN 301 [3-0]
- 412 (3) Roman Historians, II. – Tacitus. Prerequisite: LATN 301 [3-0]
- 413 (3) Prose of the Roman Republic, I. – Cicero, speeches and letters. Prerequisite: LATN 301 [3-0]
- 414 (3) Prose of the Roman Republic, II. – Caesar and Sallust. Prerequisite: LATN 301 [3-0]
- 416 (3) Lucretius. – Selections from the De Rerum Natura. Prerequisite: LATN 301 [3-0]
- 417 (3) Vergil. – The Eclogues, Georgics and Aeneid. Prerequisite: LATN 301 [3-0]
- 418 (3) Latin Comedy. – Plays of Plautus and Terence. Prerequisite: LATN 301 [3-0]
- 419 (3) Latin Satire – Satires of Horace and Juvenal. Prerequisite: LATN 301 [3-0]
- 420 (3) Latin Lyric Poetry – Catullus and Horace. Prerequisite: LATN 301 [3-0]
- 421 (3) Latin Elegiac Poetry. – Ovid, Propertius, Tibullus. Prerequisite: LATN 301 [3-0]
- 425 (3) Advanced Composition – Obligatory for Honours students in the third or fourth year. Prerequisite: LATN 301 [2-0; 2-0]
- 521 (3/6) c Studies in Latin Literature
- 525 (3/6) d Seminar in Latin Literature
- 530 (3/6) d Seminar in Roman Archaeology
- 535 (3/6) d Seminar in Roman History
- 540 (3/6) d Seminar in Latin Palaeography
- 545 (3/6) d Seminar in Latin Epigraphy
- 547 (0) Major Essay.
- 549 (6/12) c Master's Thesis
- 550 (3/6) c Directed Studies
- 649 Ph.D. Thesis
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- Law** **LAW**
FACULTY OF LAW
- 201 (4/5) d Perspectives on Law – Selected legal theories and their contribution to the understanding of law and legal institutions. [2-0; 2-0]
- 203 (4/5) d Legal Institutions of Canadian Government – The development of law through the institutions of government in Canada, including legislatures, government departments, administrative bodies, quasi-judicial tribunals, and self-governing professions. [2-0; 2-0]
- 205 (5/6) d Criminal Law and Procedure – Bases of criminal responsibility; principles and objectives of the criminal law and procedure; pre-trial procedure. [2-0; 3-0]
- 207 (6-7) d Torts – A study of the bases of civil liability for intentionally and accidentally caused harms. [3-0; 3-0]
- 209 (6-7) d Contracts – Historical development; formation and enforceability of contracts; parties; contractual terms; changes of circumstances; remedies for breach. [3-0; 3-0]
- 211 (6-7) d Real Property – Historical and conceptual analysis of interests in land, future interests, the Torrens system of land registration. [3-0; 3-0]
- 213 (0) Legal Writing and Moot Court – Each First Year student will be assigned to a small group for one First Year course. Part of the final mark for that course will be based on grades received for assignments on legal writing and research, given from time to time throughout the year. Credit
- 301 (3) Philosophy of Law – An examination of the principal schools of legal theory, such as legal positivism, legal realism, sociological jurisprudence, and contemporary rights theory. Not offered each year, consult Faculty. [3-0]
- 302 (3) Fundamental Concepts of Law – A study of some of the fundamental principles and ideas that cut across many areas of the substantive law, including such concepts as fault, intent, legal personality, possession, ownership, justice, and causation. Not offered each year, consult Faculty. [3-0]
- 303 (3) The Western Idea of Law – A comparative and interdisciplinary study of the evolution of Western law from its origins in mythology and patriarchy through to the present time. Not offered each year, consult Faculty. [3-0]
- 304 (2-4) d Psychoanalysis, Feminism, and the Law – The implications of psychoanalytic social theory for feminist legal theory, drawing on the work of Freud and Lacan. [2-0] or [3-0]
- 305 (2-4) d Law, Society and State – Theories of the relationship between the legal system, social relations and the state. Not offered each year, consult Faculty. (2-0) or (3-0)
- 307 (3) Feminist Legal Studies – A survey of feminist approaches to law, with reference to selected substantive areas of the law. (3-0)
- 308 (2-4) d Feminist Legal Theory – Recent developments in feminist legal theory. Not offered each year, consult Faculty. (2-0) or (3-0)

- 309 (2-4) d Topics in Feminist Legal Studies – Not offered each year, consult Faculty. (2-0) or (3-0)
- 310 (2-4) d Economic Analysis of Law – Economic analysis used to explore, describe, evaluate and offer prescriptive suggestions for legal decision-making. Not offered each year, consult Faculty. (2-0) or (3-0)
- 312 (2-4) d Topics in Philosophy of Law and Theoretical Perspectives – Not offered each year, consult Faculty. (2-0) or (3-0)
- 313 (3) Legal History – The relationship between law, society and historical change, normally emphasizing 19th and 20th century issues. (3-0)
- 315 (2-4) d Topics in Legal History – Not offered each year, consult Faculty. (2-0) or (3-0)
- 316 (3) International Law – (Students who have taken POLI 465 cannot take this course.) The history, sources and evidence of international law and its relation to municipal law; international personality; state jurisdiction; and treaties. (3-0)
- 317 (2-4) d Law of the Sea – International law relating to the oceans, including the regimes of inland waters, territorial seas, continental shelves, exclusive economic zones, high seas and the deep sea-bed. Not offered each year; consult Faculty. (2-0) or (3-0)
- 318 (2-4) d Marine Resources Law – Legal regimes governing the protection and exploitation of ocean resources. Not offered each year; consult Faculty. (2-0) or (3-0)
- 319 (2-4) d International Human Rights – The recognition and protection of human rights in international law. Not offered each year, consult Faculty. (2-0) or (3-0)
- 320 (2-4) d Indigenous Peoples in Comparative and International Law – The legal situation of indigenous peoples in various states and in modern international law. Not offered each year, consult Faculty. (2-0) or (3-0)
- 321 (2-4) d International Law of South-North Relations – Existence, applications and deficiencies of international law in sectors where the interests of industrialized and developing nations are linked. Not offered each year, consult Faculty. (2-0) or (3-0)
- 322 (2-4) d International Law Problems – Selected issues in international law. Not offered each year, consult Faculty. Prerequisite: LAW 316. (2-0) or (3-0)
- 323 (2-4) d International Environmental Law – Customary international law and treaties relating to the environment; institutional structures. Not offered each year, consult Faculty. (2-0) or (3-0)
- 324 (2-4) d Topics in International Law and Transactions – Not offered each year, consult Faculty. (2-0) or (3-0)
- 325 (3) Conflict of Laws – A study of the private legal problems arising in cases in which the relevant facts cut across provincial or national boundaries. Recommended to be taken in Third Year. (3-0)
- 326 (2-4) d Topics in Conflict of Laws – Not offered each year, consult Faculty. (2-0) or (3-0)
- 327 (2/3) d International Trade Law – Rules and regulatory systems that govern the international movement of capital, goods and services. (2-0) or (3-0)
- 328 (2-4) d International Business Transactions – Legal problems in international financial and commercial transactions. Not offered each year, consult Faculty. (2-0) or (3-0)
- 329 (2-4) d International Commercial Disputes – International commercial arbitration and other means for resolving legal disputes relating to international commercial transactions. Not offered each year, consult Faculty. (2-0) or (3-0)
- 330 (2-4) d Cultural Property and Law – National and international regimes for the protection of cultural property. Not offered each year, consult Faculty. (2-0) or (3-0)
- 332 (2) Maritime Law – Canadian maritime law and admiralty practice. (2-0)
- 333 (2-4) d Civil Law – Comparative study of selected legal systems belonging to the civil law family, such as those of Quebec, France, Germany or the countries of Latin America. Not offered each year, consult Faculty. (2-0) or (3-0)
- 334 (2/3) d Introduction to Asian Legal Systems – Introduction to the comparative study of legal systems of East and South-East Asia, including those of China and Japan. (2-0) or (3-0)
- 336 (2-4) d Chinese Law – A comparative study of Chinese Law, emphasizing the role of law in the People's Republic of China. (2-0) or (3-0)
- 337 (2-4) d Trade and Investment in The People's Republic of China. – The legal regime in The People's Republic of China governing trade and foreign investment. Not offered each year, consult Faculty. (2-0) or (3-0)
- 338 (2/3) d Japanese Law. – An introduction to the Japanese legal system from a comparative perspective. (2-0) or (3-0)
- 339 (2-4) d Human Rights in Asia. – Legal issues relating to civil, political, social and cultural rights in particular areas in Asia. Not offered each year, consult Faculty. (2-0) or (3-0)
- 341 (2-4) d European Union Law. – The legal system of the European Union as created by the treaties establishing the Union and by the Union's institutions. Not offered each year, consult Faculty. (2-0) or (3-0)
- 342 (2-4) d Topics in Comparative Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 343 (2-4) d Topics in Public Law – Not offered each year, consult Faculty. (2-0) or (3-0)
- 344 (6) Canadian Constitutional Law. – The general principles of Canadian constitutional law; the nature of Canadian federalism, with emphasis on the division of powers; the protection of civil liberties, with primary emphasis upon the Charter of Rights and Freedoms. Credit may not be obtained for LAW 344 and either of LAW 345 or LAW 346. (3-0; 3-0)
- 345 (3) Canadian Constitutional Law A: Federalism. – The general principles of Canadian constitutional law; the nature of Canadian federalism, with emphasis on the division of powers. Credit may not be obtained for LAW 345 and LAW 344. (3-0)
- 346 (3) Canadian Constitutional Law B: Charter of Rights. – The constitutional protection of civil liberties in Canada, with primary emphasis upon the Charter of Rights and Freedoms. Credit may not be obtained for LAW 346 and LAW 344. (3-0)
- 347 (2-4) d Fundamental Freedoms. – Doctrinal and theoretical issues in the fundamental freedoms category of the Charter of Rights and Freedoms. Not offered each year; consult Faculty. (2-0) or (3-0)
- 349 (2-4) d Topics in Constitutional Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 350 (2-4) d Issues of Equality and Social Justice. – Selected topics related to the Charter right to equality and other rights related to social justice. Not offered each year, consult Faculty. (2-0) or (3-0)
- 351 (2-4) d Topics in Human Rights. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 352 (2) First Nations and Canadian Law. – Survey of the history and present status of the legal relationships between Canada's First Nations peoples and the state. (2-0)
- 353 (2) Aboriginal and Treaty Rights. – Rights of First Nations people stemming from their aboriginal status and from treaties. Not offered each year, consult Faculty. Prerequisite or corequisite: LAW 352. (2-0)
- 354 (2-4) d First Nations Self-Government. – Issues relating to First Nations' assumption of self-government powers. Not offered each year, consult Faculty. (2-0) or (3-0)
- 355 (2-4) d First Nations and the Administration of Justice. – The justice system and its operation in relation to First Nations people. Not offered each year, consult Faculty. (2-0) or (3-0)
- 356 (2-4) d First Nations and Economic Development. – Legal issues affecting land use and economic activity involving First Nations' resources. Not offered each year, consult Faculty. (2-0) or (3-0)
- 358 (2-4) d Topics in First Nations Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 359 (3) Family Law. – The law relating to family relationships, including the law of marriage, divorce, maintenance, custody, matrimonial property, and related matters. (3-0)
- 360 (3) Children and the Law. – The civil and criminal law affecting juveniles; custody, guardianship and adoption. Recommended prerequisite: LAW 359. (3-0)
- 362 (2-4) d Topics in Family Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 363 (2-4) d Racism and Law. – Legal issues relating to race and racism, including related issues of gender, culture or identity. Not offered each year, consult Faculty. (2-0) or (3-0)
- 364 (2-4) d Topics in Race and Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 365 (2-4) d Women, Law and Family. – Feminist and other critical perspectives on the relationship between unequal gender relations and laws embodying a concept of "family". Not offered each year, consult Faculty. (2-0) or (3-0)
- 367 (2-4) d Reproduction and Law. – Legal issues relating to human reproduction. Not offered each year, consult Faculty. (2-0) or (3-0)
- 368 (2-4) d Sexuality and Law. – Legal issues relating to sexual activity, orientation and identification. Not offered each year, consult Faculty. (2-0) or (3-0)
- 369 (2-4) d Law and Aging. – The use of the law to advance the interests of older people. Not offered each year, consult Faculty. (2-0) or (3-0)
- 371 (2-4) d Topics in Law and Social Relations. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 372 (3) Administrative Law. – The system of legal control exercised through non-judicial agencies and the relationship of the courts to the administrative process. (3-0)
- 373 (2-4) d Topics in Administrative Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 374 (3) Municipal Law. – The municipality as a legal entity; its creation, operation and powers; by-laws and their validity; contractual liability; judicial review; business regulation; expropriation and land use control. (3-0)
- 375 (2/3) d Land Use Planning. – The legal and administrative aspects of the regulation of land use and development, especially at the local level. Not offered each year, consult Faculty. (2-0) or (3-0)
- 376 (2-4) d Topics in Municipal and Planning Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 377 (2) Immigration Law. – Admission of immigrants into Canada; practice and procedure before immigration tribunals and the courts. (2-0)
- 378 (2-4) d Issues in Immigration and Refugee Law. – Selected issues related to the law and process of immigration and refugee determination. Not offered each year, consult Faculty. (2-0) or (3-0)
- 381 (2-4) d Disabilities and Law. – Legal issues relating to people with disabilities. Not offered each year, consult Faculty. (2-0) or (3-0)
- 382 (2-4) d Law and Medicine. – Legal issues relating to medicine and the health care system. (2-0) or (3-0)
- 383 (2-4) d Mental Health Law. – The law relating to commitment and treatment issues for persons with mental disabilities. (2-0) or (3-0)
- 384 (2-4) d Law and Psychiatry. – The interaction of psychiatry and criminal law; legal issues relating to those who enter the psychiatric system through the criminal justice system. Not offered each year, consult Faculty. (2-0) or (3-0)

- 385 (2-4) d Social Welfare Law. – Aspects of the law structuring the provision of welfare and other social services in Canada. Not offered each year, consult Faculty. (2-0) or (3-0)
- 387 (2/3) d Canadian Environmental Law. – The legal and regulatory framework for the protection of the environment. (2-0) or (3-0)
- 388 (2-4) d Environmental Law in Practice. – Jurisdiction, remedies and administrative schemes as they apply in practice to selected environmental law problems. Not offered each year, consult Faculty. (2-0) or (3-0)
- 389 (2-4) d Selected Issues in Environmental Law and Policy. – Case studies of leading problems in environmental law and regulation. Not offered each year, consult Faculty. (2-0) or (3-0)
- 391 (2-4) d Topics in Environmental Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 392 (2/3) d Natural Resources. – A foundation course dealing with legal problems common to the management of natural resources such as fisheries, mines and minerals, petroleum, forests, and water resources. (2-0) or (3-0)
- 393 (2) Water Law. – The law relating to the acquisition and protection of water rights; public management and planning; water quality and conservation. Not offered each year, consult Faculty. Recommended prerequisite: LAW 392. (2-0)
- 394 (2) Mining Law. – Acquisition of mineral interests; development, financing and organization of mining companies; regulation of exploitation industry interests; management taxation. Not offered each year, consult Faculty. Recommended prerequisite: LAW 392. (2-0)
- 395 (2) Forest Law. – Acquisition of timber interests; development, financing and organization of timber companies; regulation of exploitation industry interests; management taxation. Not offered each year, consult Faculty. Recommended prerequisite: LAW 392. (2-0)
- 396 (2/3) d Fisheries Law – Legal regimes for the exploitation and regulation of fisheries. Not offered each year, consult Faculty. Recommended prerequisite: LAW 392. (2-0) or (3-0)
- 397 (2/3) d Oil and Gas Law – Legal regimes for the disposition of interests in petroleum; government regulation. Not offered each year, consult Faculty. Recommended prerequisite: LAW 392. (2-0) or (3-0)
- 398 (2-4) d Topics in Natural Resources. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 399 (2) Advanced Criminal Law. – Selected topics in advanced substantive criminal law and related issues. (2-0)
- 400 (2) Advanced Criminal Procedure. – Selected topics relating to procedural law and practice in criminal matters. (2-0)
- 401 (2-4) d Penal Policy. – Selected legal policy issues relating to punishment for crime. Not offered each year, consult Faculty. (2-0) or (3-0)
- 402 (2-4) d Juvenile Justice. – The causes of juvenile crime; models of juvenile justice systems; the treatment of juvenile offenders; comparison of relevant Canadian legislation with that in other countries. Not offered each year, consult Faculty. (2-0) or (3-0)
- 403 (2-4) d Criminology. – Relations among the legislative, police, courts and penal organizations in the criminal justice system, and relations between the criminal justice system and other social institutions. Not offered each year, consult Faculty. (2-0) or (3-0)
- 405 (2-4) d Topics in Criminal Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 406 (2-4) d Topics in Criminal Justice. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 407 (3) Taxation I. – A survey of the law and practice of income and capital gains taxes. (3-0)
- 408 (2/3) d Taxation II. – The taxation of corporations, the taxation of shareholders, and the tax implications of the reorganization of corporations. Prerequisite: LAW 407. (2-0) or (3-0)
- 409 (2-4) d Tax and the Family. – Financial and tax planning for an individual during lifetime and on death. Not offered each year, consult Faculty. Students cannot receive credit for LAW 409 and COMM 357. Prerequisite: LAW 407. (2-0) or (3-0)
- 410 (2/3) d International Taxation. – The tax aspects of international transactions. Not offered each year, consult Faculty. (2-0) or (3-0)
- 411 (2-4) d Tax Policy. – The policies underlying the creation and implementation of tax laws. Not offered each year, consult Faculty. (2-0) or (3-0)
- 413 (2-4) d Topics in Taxation Law. – Not offered each year, consult Faculty. [2-0] or [3-0]
- 414 (2-4) d Competition Policy. – The law and policy relating to the regulation of competition in Canada and other jurisdictions. Not offered each year, consult Faculty. (2-0) or (3-0)
- 415 (3) Labour Law. – Union-management relations; the collective bargaining process; the collective agreement, arbitration and conciliation procedure. The relationship between the union and its membership. (3-0)
- 416 (2-4) d Human Rights and Labour. – Human rights issues relating to the workplace. Not offered each year, consult Faculty. (2-0) or (3-0)
- 417 (2-4) d Labour Law and Policy. – The role of the law in the operation of the labour market. Not offered each year, consult Faculty. (2-0) or (3-0)
- 418 (2-4) d Resolution of Labour Disputes. – Labour arbitration and collective agreement negotiation and interpretation. Not offered each year, consult Faculty. Recommended prerequisite: LAW 415. (2-0) or (3-0)
- 419 (2-4) d Individual Employment Law. – Legal aspects of employment relationships other than those arising by collective bargaining. Not offered each year, consult Faculty. (2-0) or (3-0)
- 421 (2-4) d Topics in Labour Law – Not offered each year, consult Faculty. (2-0) or (3-0)
- 422 (3) Intellectual Property. – Copyright, patents, trade marks, industrial design, the protection of computer software, and torts such as passing-off and breach of confidence. (3-0)
- 423 (2-4) d Topics in Intellectual Property. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 424 (2-4) d Communications Law. – Selected legal issues relating to the communications industries and their regulation. Not offered each year, consult Faculty. (2-0) or (3-0)
- 426 (2-4) d Topics in Law and Technology. – Not offered each year, consult Faculty. [2-0] or [3-0]
- 427 (3) Legal Reasoning and Artificial Intelligence. – The nature and structure of legal reasoning and how to think about and analyse legal issues and problems, through representing legal knowledge in computer-based information systems such as expert systems. Not offered each year, consult Faculty. (3-0)
- 428 (2/3) d Law and Information Technology. – Acquisition, structuring and presentation of legal and non-legal information in the practice of law, and the use of computer-based technology to research, access, organize and disseminate legal information. (2-0) or (3-0)
- 429 (2-4) d Advanced Law and Information Technology. – Techniques in the computer-based analysis, representation, processing and retrieval of legal information; the creation and maintenance of specialized legal information systems. Not offered each year, consult Faculty. (2-0) or (3-0)
- 430 (2-4) d Advanced Legal Research. – Research using electronic databases, information systems, and non-legal databases relevant to the resolution of legal issues. (2-0) or (3-0)
- 432 (2-4) d Topics in Private Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 433 (2-4) d Personal Injury Law. – Issues arising in a personal injury lawsuit, including solicitor-client relations and the civil litigation process. Not offered each year, consult Faculty. (2-0) or (3-0)
- 435 (2-4) d Topics in Tort Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 436 (2/3) d Restitution. – Unjust enrichment as the basis of civil liability. Not offered each year, consult Faculty. (2-0) or (3-0)
- 437 (3) Commercial Transactions. – The law of sale of goods, bills of exchange, promissory notes, and cheques. (3-0)
- 438 (3) Secured Transactions. – The law governing the creation, perfection and enforcement of security interests in personal property. (3-0)
- 439 (2-4) d Construction Law. – Legal issues relating to the construction process. Not offered each year, consult Faculty. (2-0) or (3-0)
- 440 (2) Insurance Law. – The general legal principles of life, automobile, fire and other types of insurance; the regulation of the insurance industry. (2-0)
- 441 (2/3) d Consumer Protection. – Relation of the legal process to the marketplace; history of market practices; appraisal of how the political process treats consumer proposals; the overcommitted debtor; adequacies of government services for the consumer. Not offered each year, consult Faculty. Recommended prerequisites: LAW 437; LAW 438. (2-0) or (3-0)
- 443 (3) Creditors' Remedies. – Remedies of an unsecured creditor; fraudulent conveyances and preferences; builders' liens; bankruptcy. Recommended prerequisites: LAW 437; LAW 438. (3-0)
- 444 (2-4) d Insolvency Law. – The law relating to insolvency, receivership and bankruptcy. Not offered each year, consult Faculty. (2-0) or (3-0)
- 446 (2-4) d Problems in Commercial Law and Transactions. – Selected commercial transactions examined from the point of view of legal theory and practice. Not offered each year, consult Faculty. (2-0) or (3-0)
- 447 (2-4) d Topics in Commercial Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 448 (2-4) d Sports Law. – Legal issues relating to the sports industry and those who participate in it. Not offered each year, consult Faculty. (2-0) or (3-0)
- 449 (2-4) d Media and Entertainment Law. – Selected legal issues relating to the media and entertainment industries and their regulation. Not offered each year, consult Faculty. (2-0) or (3-0)
- 450 (2-4) d Topics in Sports, Media, Entertainment or Communications Law. – Not offered each year, consult Faculty. [2-0] or [3-0]
- 451 (3) Trusts. – History and nature of trusts; express, resulting, implied and constructive trusts; charitable and purpose trusts; administration of trusts; breach of trust. (3-0)
- 452 (2) Succession. – The law of wills and intestate succession, variation of wills, principles of probate and administration of estates. Recommended prerequisite: LAW 451. (2-0)
- 453 (2) Equitable Remedies. – The history and development of equitable remedies such as specific performance, injunctions, declarations, relief against forfeiture, and tracing. (2-0)
- 454 (2-4) d Topics in Trusts and Estates. – Not offered each year, consult Faculty. [2-0] or [3-0]

- 455 (3) Real Estate Transactions. – The law relating to the sale and purchase of land, real estate agency, and mortgages. (3-0)
- 456 (2) Real Estate Lease Law. – The law relating to residential and commercial tenancies. Not offered each year, consult Faculty. (2-0)
- 457 (2-4) d Real Estate Development. – A study of the legal aspects of the development of real estate projects such as shopping centres, sports centres and condominiums. Not offered each year, consult Faculty. Prerequisite: LAW 456. (2-0) or (3-0)
- 458 (2-4) d Topics in Real Property. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 459 (3/4) d Corporations I. – The law of corporations, including the rights and duties of directors and shareholders. (3-0), (2-0;2-0) or (4-0)
- 460 (3) Corporations II. – Selected topics such as the nature of shares, equity financing, corporate structure and reorganization, and shareholder squeezeouts. Prerequisite: LAW 459. (3-0)
- 461 (2-4) d Corporate Transactions. – Legal aspects of selected transactions relating to public corporations and corporate governance. Not offered each year, consult Faculty. [2-0] or [3-0]
- 462 (2-4) d Close Corporations. – The corporation, taxation, accounting, insurance and estate planning aspects of the close corporation. Not offered each year, consult Faculty. Prerequisite: LAW 459. (2-0) or (3-0)
- 463 (2/3) d Securities Regulation. – The law relating to the distribution of securities. Continuous and timely disclosure requirements and civil liability. Recommended prerequisite: LAW 459. [2-0] or [3-0]
- 464 (2-4) d Theory of the corporation. – Theoretical perspectives on business organizations. Not offered each year, consult Faculty. (2-0) or (3-0)
- 467 (2-4) d Topics in Corporate Law. – Not offered each year, consult Faculty. (2-0) or (3-0)
- 468 (2) Professional Responsibility. – The nature, role and organization of the legal profession; philosophical and ethical dimensions of the role of lawyers. (2-0)
- 469 (2) Civil Litigation. – Problems in the conduct of civil litigation including: ethical considerations; substantive problems such as notice, pleading and discovery; and selected procedural problems. (2-0)
- 470 (4) Evidence. – The admissibility and use of evidence in litigation. (2-0; 2-0) or (4-0)
- 471 (2-4) d Rules of Evidence and the Process of Proof. – Fact investigation; integrating legal theories, factual propositions and evidence. Not offered each year, consult Faculty. (2-0) or (3-0)
- 473 (2-4) d Appellate Advocacy. – Issues relating to advocacy before appellate courts; techniques of appellate advocacy. Not offered each year, consult Faculty. (2-0) or (3-0)
- 474 (3) Trial Advocacy. – Techniques of advocacy in civil and criminal cases including interviewing, pre-trial preparation, tactical analysis, development of facts, direct and cross examination and various ethical considerations. A student who receives credit for LAW 488 or LAW 491 cannot receive credit for this course. Prerequisite: LAW 470. (4-0)
- 476 (2-4) d Psychology and Litigation – Human psychology as it is treated in different areas of law and litigation. Not offered each year, consult Faculty. [2-0] or [3-0]
- 477 (2-4) d Negotiation and Dispute Resolution – Negotiation and bargaining; formulation of general principles governing the negotiation process; negotiation in legal practice; alternative means of dispute resolution. (2-0) or (3-0)
- 478 (2-4) d Alternative Dispute Resolution – Theoretical premises underlying the dispute-resolving process: arbitration, other non-judicial means of resolving legal disputes, and their relationship to litigation. Not offered each year, consult Faculty. (2-0) or (3-0)
- 479 (2-4) d Mediation – Mediation of legal disputes; negotiation theory and practice as they relate to mediation. Not offered each year, consult Faculty. (2-0) or (3-0)
- 481 (2-4) d Topics in Litigation, Dispute Resolution and the Administration of Justice – Not offered each year, consult Faculty. [2-0] or [3-0]
- 482 (2-4) d Topics in Procedure and Evidence – Not offered each year, consult Faculty. (2-0) or (3-0)
- 483 (2) Moot Court – This course consists of two parts, both to be completed in second year: (a) preparation of a factum and presentation of oral argument at a moot court held in the First term; (b) either (i) acting as a judge, which includes writing a judgement, for a first year moot, held in the Second term; or (ii) with Faculty approval, doing an independent piece of legal research, equivalent to a Law Review note, on a particular aspect of legal practice. // A student's moot performance will be entered on the record maintained by the Faculty although no entry will appear on the official University transcript beyond one indicated that the course has been completed satisfactorily. Students who do not perform adequately in their own moot will be required to re-moot in the second term of second year or in third year until a satisfactory performance is achieved. Note: A student who participates in any official intra- or inter-faculty moot competition in second year will be deemed to have satisfied both parts of the course.
- 484 (3) Competitive Moots Advocacy – A seminar on appellate practice in British Columbia. Restricted to students in the Faculty's competitive moot programs. (3-0)
- 485 (3) Client Counselling Competition Credit – Interviewing, counselling and negotiating. (For students representing the Faculty in the annual International Client Counselling Competition.) (3-0)
- 486 (2) Law Review Credit – Study and practice of law journal editing and business operations. (For students acting as senior editors or the business manager for the UBC Law Review, the Canadian Journal of Family Law or any other equivalent legal journal based in the Faculty of Law).
- 488 (11) Clinical Term – Open to a limited number of students in second and third year. The clinical experience will be designed to explore the functioning of the legal system in relation to members of society who are socially, economically or politically disadvantaged. Under the supervision of Faculty and Staff Lawyers, students will act for clients in a range of legal matters and can expect to represent clients before courts and tribunals. Students will also work with community-based organizations that are active in addressing the needs of the disadvantaged. The program includes a significant classroom component, and students are required to submit a paper on some aspect of the legal system as it relates to the disadvantaged, see LAW 489. A student who receives credit for LAW 474, LAW 490 or LAW 491 cannot receive credit for this course. Prerequisite or corequisite with permission: LAW 470.
- 489 (4) Clinical Term: Paper – The graded component of LAW 488.
- 490 (6) Clinical Criminal Law – The aim of the course is to teach a basic familiarity with the skills required for the practice of criminal law. Students will represent defendants in summary conviction cases under supervision of an experienced lawyer. A student who receives credit for LAW 488 or LAW 491 cannot receive credit for this course. Prerequisites: LAW 470 and LAW 400. (6-0)
- 491 (4) Law Students Legal Advice Program Credit. – Restricted to a limited number of third year students who (a) in their first or second year have participated in the provision of legal services to the public through the Law Students Legal Advice Program operated under the supervision of the Community Legal Assistance Society, and (b) continue that participation in their third year. A student who receives credit for LAW 474, LAW 488 or LAW 490 cannot receive credit for this course.
- 493 (2-4) d Directed Research – Enrolment restricted.
- 494 (2-4) d Directed Research – Enrolment restricted.
- 495 (2-4) d Directed Research – Enrolment restricted.
- 496 (2-4) d Directed Research – Enrolment restricted.
- 497 (3) Law for Teachers: Introduction to Legal Process – An introduction to law-related aspects of the school curriculum, including the nature and purpose of law, legal institutions, legal procedures, legal reasoning and skills in dealing with legal materials, such as cases and statutes. Offered extra-sessionally
- 498 (5) Law for Teachers: Introduction to Substantive Law – An introduction to areas of law such as family, constitutional, criminal, labour, contract, tort, and property law. Comparative, historical, economic and political aspects will be discussed together with legal aspects. Offered extra-sessionally only. Not for credit in the Faculty of Law.
- 500 (4) Current Legal Problems
- 501 (2-6) d Directed Research – Students will be able to undertake advanced research into a topic approved by a faculty member, under the supervision of and in consultation with, that faculty member.
- 510 (2-4) d Sentencing – Comparative sentencing structures; competing sentencing philosophies and principles; the exercise of discretion; sentencing law and practice; sentencing advocacy; aids to sentencing, such as computerized information systems; prescriptive guidelines; problematic issues in sentencing, such as wife and child abuse.
- 511 (2-4) d International Criminal Law – Analysis of topics such as jurisdiction, immunity from prosecution, mutual assistance in penal matters, recognition and enforcement of foreign penal laws, and international police co-operation; examination of selected offences such as war crimes, crimes against humanity, genocide, terrorism, illicit drug trafficking and torture.
- 512 (2-4) d Proceeds of Crime – Criminal and civil law relating to the tracing, freezing and forfeiture of proceeds derived from crime; a comparative analysis of law from Canada, the US, and other jurisdictions; bilateral and multilateral Conventions dealing with issues such as money laundering, bank secrecy and tax havens.
- 518 (2-4) d Feminist Legal Studies: Key Themes and Current Debates – Diverse theoretical perspectives, key resources for feminist research on law, and the viability of different strategies or methods of engaging with law.
- 520 (2-4) d Asian Law Tutorial
- 519 (20) Master's Thesis
- 610 (2) Doctoral Seminar I: Issues in Legal Theory – This seminar will address issues salient of legal theory. Topics covered will include feminism and the law; Marxism and the law; post-modernism and the law; social theory and the law; law and the state; legal liberalism and its critics; and other jurisprudential discourses.
- 611 (2) Doctoral Seminar II: Comparative and Interdisciplinary Perspectives on Legal Theory – This seminar will address issues of legal theory in interdisciplinary and comparative perspective. Discussion will focus on the applicability of legal concepts in different cultures and societies, and the consequences for the form and structure of law. Topics such as "the origins and development of legal traditions in Europe and Asia", and "the influence of religion in Asian and European legal systems: could be included. In addition, discussion will address the applicability of concepts drawn from fields outside of law to legal research and scholarship.

Library and Information Studies LIBR
SCHOOL OF LIBRARY, ARCHIVAL AND
INFORMATION STUDIES, FACULTY OF ARTS

- 500 (3) Foundations of Information – Theories and principles of creating, disseminating, and using information; the concept of intellectual property in the private and public sectors; intellectual freedom and censorship; the impact of physical and particularly electronic distribution systems on access and use; information policy; the role of the profession and its institutions in information access; ethical issues.
- 510 (3) Bibliographic Control of Information I – Basic practices of citation and bibliographic description in manual and automated modes, and of subject analysis including classification. Introduction to the Anglo-American Cataloguing Rules, subject-headings lists, the Dewey Decimal Classification and the MARC format.
- 511 (3) Bibliographic Control of Information II – Advanced bibliographic description; detailed study of the subject headings system and classification scheme of the Library of Congress; authority control; applying automated techniques.
- 512 (3) Indexing – Theory and application of techniques such as vocabulary control, indexing languages, thesauri, design of access points, and precision/recall devices to provide intellectual access to information. Same as ARST 512.
- 514 (3/6) d Topics in the Bibliographic Control of Information – Principles and practices in applying international standards of description to a variety of document types including serials and audiovisual materials.
- 516 (3) Records Management – The generation, control, organization, storage, and retrieval of records. Records management in relation to libraries.
- 518 (3) Historical Bibliography – The development of the book as a physical object of commerce and a social force.
- 519 (3) History of Archival Concepts – Origins and development of archival concepts, principles, and methods through an examination of laws, literature, and instruments of archival practice internationally. Same as ARST 519.
- 520 (3) Collection Management – Developing and managing library collections to meet the information needs of users; sources and acquisition of materials; policies governing their use; networking and resource sharing.
- 522 (3/6) d Literature and Other Materials for Children – The development of children's literature from the fifteenth century to the present; analysis of world mythology and folklore; genres; audiovisual materials and electronic media for the young; trends and issues in the field.
- 524 (3) Literature and Other Materials for Young Adults – Survey of materials of special appeal to adolescents; factors affecting reading interests and habits.
- 527 (3) Publishing and the Book Trade – Commercial aspects of the present-day information industries, from authorship through distribution. Special emphasis on issues of current Canadian interest and on issues most relevant to librarians, e.g. copyright protection and its proposed extensions, the Canadian distribution system, sources of library supply.
- 538 (3/6) d Specialized Literatures – The literature of a specified discipline or interdisciplinary area viewed in the light of its structure and types of publication; its bibliographic control and the information-seeking behaviour of its users.
- 539 (3/6) d Specialized Materials – Selection, bibliographic control, storage, administration, and use of a specialized category of material; archival materials, audiovisual materials, government publications, serials.
- 540 (3) Reference and Information Services I – Types of print and electronic information sources and their organization; question analysis and the reference interview; effective strategies for searching manual and machine-readable sources; reference work in libraries and other information agencies.
- 541 (3) Reference and Information Services II – Types of print and electronic information sources in various fields of knowledge in relation to the nature of communication and research in these fields. bibliographic instruction; document delivery; ethical issues; trends in administering information services.
- 542 (3/6) d Services for Youth – Selecting materials, implementing programs and user advisory services, and administering services for youth, primarily in public libraries.
- 544 (3/6) d Services for Adults – Guiding adults, as individuals and in groups, in their use of library resources and services in various types of library. Establishing and administering the policies and practices of such service.
- 545 (3/6) d Services for Groups with Specialized Interests – Designing, planning and administering services for definable user groups.
- 548 (3/6) d Issues in Reference and Information Services – Current trends and issues in public services, including circulation, reference and information services, interlibrary lending and document delivery, in various types of libraries.
- 550 (3) Systems Analysis and Design of Information Systems – Analysing, developing, selecting, implementing, and evaluating computer-based information systems in libraries and related agencies.
- 551 (3) Design and Management of Textual Databases – Record structures; developing and implementing various types of databases used in libraries and related information-based environments; using and modifying commercial software; interface design.
- 553 (3) User-Oriented Design of Information Retrieval Systems – Designing, using, and evaluating information storage and retrieval systems in libraries and related agencies based on the needs and perspectives of different types of users and information.
- 555 (3) Management of Electronic Records – Information capture, processing, storage, and communication technologies in recordkeeping; the role of standards in supporting integrated systems; methods for the maintenance and disposition of electronic records. Prerequisite: LIBR 516. Same as ARST 555.
- 559 (3/6) d Topics in Computer-Based Information Systems – Lectures and readings on specialized topics in information systems design, maintenance, and use.
- 560 (3) Functions and Services of Information-Based Organizations – Mission, goals, activities, and history of libraries and related types of organization in the public and private sectors; the impact of contemporary social trends and technological changes on their development.
- 569 (3/6) d Current Issues and Trends in Library Services and Information Science – Topics of current interest and concern to the profession.
- 570 (3) Management of Libraries and Archives – An introduction to contemporary management theory and its application in the administration of libraries and archives. Same as ARST 570.
- 578 (3) Planning And Design Of Libraries – Programming of library buildings for efficient utilization; planning space requirements for new buildings and alterations; selection of library equipment.
- 579 (3/6) d Topics in the Management of Libraries and Archives – Lectures and readings on specialized topics relating to the management of libraries and archives.
- 587 (3) Preservation – Characteristics of storage media for documents; environmental, biological, and technological factors in their deterioration and methods of counteracting them; management of preservation programs. Same as ARST 587.
- 590 (3) Research Methods in Libraries and Archives – Principles and methods of research and investigation and their application to various situations in libraries and archives. Same as ARST 590.
- 591 (3) Topics in Research Methods
- 592 (3-6) c Directed Research Project Prerequisite: 590.
- 593 (3/6) d Seminar – Special problems in library service.
- 594 (3-6) c Directed Study
- 595 (0) Practicum – A practicum of at least two weeks' duration which offers an overview of basic library functions, taken in a library under the supervision of a professional librarian.
- 596 (3) Professional Experience – Project-based experience undertaken with a faculty associate occupying a minimum of ten hours a week for 12 consecutive weeks or the equivalent if a student is not simultaneously taking other course work in the program. Prerequisite: completion of 24 credits in the program and 595.
- 598 (0) Major Essay
- 599 (12) Thesis

Linguistics
FACULTY OF ARTS

LING

- 100 (6) Introduction to General Linguistics – The nature of language; the major language families of the world. Linguistic change: languages and dialects; history of language. Universal features of language: typology and the comparative study of languages. Sound systems; writing systems; theories of grammar; dictionaries; the study of meaning. Language and the individual; language and society. Applications of linguistics. [3-0; 3-0]
- 200 (6) General Linguistics: Phonology and Grammar – Part I - Introduction to phonetics and phonology: training in the identification and production of speech sounds; principles and methods for describing and writing the sound system of a language; phonological theory with reference to selected languages; laboratory practice. Part II - Introduction to grammatical analysis: morphology and syntax; synchronic analysis and description with illustrations from various languages. [3-1; 3-0]
- 300 (3) Studies in Grammar I – Generative theories as applied to morphology, syntax, and semantics. Throughout this course the data will be taken from English. Prerequisites: LING 200 or 420 or ENGL 329. [3-0; 0-0]
- 301 (3) Studies in Grammar II – More advanced studies in the areas covered in LING 300, including a critical examination of current contributions to syntactic theories. Prerequisite: LING 300. [0-0; 3-0]
- 310 (3) Phonetics Practicum – Practice in the discrimination, production, and description of sounds in a variety of languages. Prerequisite: LING 100 or 200 or 420 or ENGL 329. [0-0; 3-0]
- 316 (3) Speech Production Mechanisms – Anatomy and physiology of the speech production mechanism. Introduction to physiological phonetics. Coordination of different systems; coarticulation and inter-articulator timing. Prerequisite: LING 200. Recommended: PSYC 201 and 202 or PSYC 260. [3-0]
- 317 (3) Acoustic Phonetics – Acoustics relevant to speech and hearing. Source-filter theory; acoustic cues in vowels and consonants. Limited discussion of speech perception. Prerequisites: LING 200, 316. Recommended: PSYC 201 and 202 or 260, PSYC 313. [3-2]
- 319 (6) Comparative and Historical Linguistics – The nature and development of language; the history of alphabetic writing: the diachronic and diatopic study of language; linguistic change; the classification of languages with particular stress on the Indo-European group. Prerequisite: LING 200 or 420. [3-0; 3-0]
- 320 (3/6) d 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. (Also listed as RMST 478 and FREN 478.) [3-0] or [3-0; 3-0]
- 350 (6) Language Acquisition in Children – Introduction to the study of language acquisition in children: linguistic analysis of phonological, syntactic, and semantic stages of development. Other topics include babbling, bilingualism, and environmental influences. Prerequisite: LING 200 or 420. [3-0; 3-0]
- 400 (3) Studies in Phonology I – Introduction to phonological analysis and theory, with a strong emphasis on description and analysis of data from a wide variety of languages. Prerequisite: LING 200 or 420 or ENGL 329. [3-0; 0-0]
- 401 (3) Studies in Phonology II – A more advanced study of the phonological issues introduced in Linguistics 400. Critical examination and application of recent theoretical developments. Prerequisite: LING 400. [0-0; 3-0]
- 405 (3/6) d Morphology – Analytic problem-solving and discussion of theoretical questions concerning the development and present status of morphological theory. Topics include: problems in the identification and classification of morphemes, the analysis of morphophonemic alternation, Item and Arrangement as opposed to Item and Process descriptions, principles governing the word-formation processes of inflection, derivation and compounding and discussion of the form, place and function of a morphological component within grammar. [3-0] or [3-0; 3-0]
- 415 (3/6) d Experimental Phonetics – Introduction to the use of instruments for experimental phonetic research and to the design of phonetic and phonological experiments. Prerequisites: LING 310 and 315, or permission of the instructor. [1-4] or [1-4; 1-4]
- 420 (6) Introduction to Linguistics – General background to linguistic studies; the different approaches to the analysis of languages; synchronic, diachronic, and diatopic linguistics; phonetics, phonology, morphology, syntax, and semantics. Not available for credit toward a Major or Honours program in Linguistics. [3-0; 3-0]
- 427 (3/6) d Introduction to Semantics – Part I - Lexical analysis: the linguistic sign, language and thought, semantic fields and componential analysis, basic semantic relationships. Part II - Syntax and semantics: propositions and semantic cases, anaphora, negation, quantifiers, semantic interpretation in current syntactic theories. Offered in alternate years. Prerequisite or corequisite: LING 300. [3-0] or [3-0; 3-0]
- 430 (3/6) d Honours Seminar in Linguistics – Research papers on general linguistic topics to be read and discussed. [3-0] or [0-3; 0-3]
- 431 (3) Field Methods: Phonology – Elicitation, transcription, organization, and analysis of phonological data from a native speaker of a language not commonly studied. Practical experience in the use of conventional field work equipment. Offered in alternate years. Prerequisites: LING 310 and 400. [3-0; 0-0]
- 432 (3) Field Methods: Morphology and Syntax – Elicitation, transcription, organization and analysis of morphological and syntactic data from a native speaker of a language not commonly studied. Practical experience in the use of conventional field work equipment. Offered in alternate years. Prerequisites: LING 310 and 300. [0-0; 3-0]
- 433 (3) Native Languages of North America – Survey of the indigenous languages of North America. Study of the basis of genetic classification of these languages and areal similarities among them. The structure of representative languages will be presented and contrasted. The present status of American Indian languages will be considered. [3-0; 3-0]
- 434 (3) Native Languages of Canada – Classification and structure of the indigenous languages of Canada. Survey of their present status, native language programs, and efforts to preserve and maintain them. [0-0; 3-0]
- 435 (3/6) d Language Typology and Universals – Introduction to the typological and contrastive study of languages and phonology, morphology, syntax, and semantics; the relation between typology and universals; the role of universals in linguistic theory. [3-0] or [3-0; 3-0]
- 437 (3/6) d Language of the Year – The structure of one of the world's thousands of languages will be investigated in linguistic terms. The language chosen will vary from year to year, depending on expertise available. The primary purpose of the course is to understand the nature and structure of the language, not to achieve communicative competence. Prerequisite: LING 200.
- 445 (3/6) d Sociolinguistics – The systematic study of language as a social phenomenon. [3-0] or [3-0; 3-0]
- 447 (3/6) d Topics in Linguistics [3-0] or [3-0; 3-0]
- 448 (3/6) d Directed Studies – Supervised by a faculty member chosen by the student. Agreement of Supervisor and approval of Head required. [3-0] or [3-0; 3-0]
- 449 (6) Honours Essay
- 501 (3/6) d Syntactic Theory – Discussion and critical analysis of the literature on current issues in syntactic theory. Prerequisite: at least one year of syntax.
- 505 (3/6) d Issues in Morphological Theory and Analysis – Morphology from both historical and theoretical perspectives. Prerequisites: LING 301 and 401, or equivalent.
- 509 (3) Phonological Theory and Analysis I Prerequisites: LING 400 and 401.
- 510 (3) Phonological Theory and Analysis II Prerequisite: LING 509.
- 512 (3) Current Models of Phonology – Survey of current phonological models such as autosegmental theory, metrical tree vs. grid theory, syllable structure, and alternative frameworks of segmental representation. Prerequisites: LING 509 and 510, or equivalent.
- 514 (3) Advanced Research Seminar in Phonology Prerequisite: LING 512 or equivalent.
- 519 (3/6) d Problems in Comparative and Historical Linguistics
- 520 (3/6) d Problems in Grammatical Analysis
- 522 (3) Current Models of Syntax – Survey of current theories such as relational grammar, generalized phrase-structure grammar, and lexical functional grammar. Prerequisites: LING 501 and 520, or equivalent.
- 524 (3) Advanced Research Seminar in Syntax Prerequisite: LING 522 or equivalent.
- 525 (3/6) d Problems in Semantics
- 530 (3-12) d Linguistic Problems in a Special Area
- 531 (3) Field Methods in Linguistics I
- 532 (3) Field Methods in Linguistics II Prerequisite: LING 531.
- 533 (3/6) d Indian Languages of the Northwest
- 538 (3/6) d Seminar on Language Acquisition in Children – Linguistic analysis of data from children learning a first language. Intensive examination of a topic that will vary each year dealing with advanced research into phonological, syntactic, and semantic aspects of language acquisition.
- 545 (3/6) d Problems in Sociolinguistics
- 546 (3/6) c Directed Reading in Topics related to Linguistics
- 548 (0) Major Essay
- 549 (3/6/9) c Master's Thesis
- 649 Ph.D. Thesis
- opportunities offered by the Marine Station. (Note: the member of faculty supervising the study may be a member of the teaching staff participating in the curriculum offered at the Marine Station; a member of faculty of WCUMBS spending the summer at the Marine Station as a research investigator; or the student may be indirectly under the supervision of a member of faculty at one of the members of WCUMBS.)
- 401 (6) Special Topics in Marine Biology – This course will be offered, as opportunities arise, by distinguished scientists visiting at the Bamfield Marine Station. It is expected that the course will generally be of a specialized nature and be at a level appropriate to graduate or senior undergraduate students.
- 402 (3) Special Topics in Marine Biology – This course will be offered, as opportunities arise, by distinguished scientists visiting at the Bamfield Marine Station who are prepared to offer a course extending over a 3-week period. This course will be of a specialized nature and at a level appropriate to graduate or senior undergraduate students.
- 410 (6) Marine Invertebrate Zoology – A survey of the marine phyla, with emphasis on the benthic fauna in the vicinity of the Marine Station. The course includes lectures, laboratory periods, field collection, identification and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.
- 411 (6) Comparative Invertebrate Embryology – A comprehensive study of development of marine invertebrates available at the Bamfield Marine Station, including all major phyla and most of the minor phyla. Prerequisite: prior course in invertebrates or embryology.
- 412 (6) Biology of Fishes – Classification, physiology, ecology, behaviour and zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. Prerequisite: course in comparative vertebrate anatomy. Credit will be given for only one of MRNE 412 and BIOL 426.
- 413 (6) Biology of Marine Molluscs – Advanced course of selected topics emphasizing functional morphology, ecology and evolution. Field trips survey representative molluscs of the Bamfield region. Students are expected to complete an independent field or laboratory study of selected molluscs. Prerequisites: MRNE 410 or equivalent.
- 420 (6) Marine Phycology – A survey of the marine algae, with emphasis on the benthic forms in the vicinity of the Marine Station. The course includes lectures, laboratory periods, field collection, identification and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.
- 430 (6) Marine Ecology – An analytical approach to biotic associations in the marine environment. Opportunities are provided for study of the intertidal realm in exposed and protected areas, and of beaches and estuaries, in the vicinity of the Marine Station; plankton studies and investigations of the subtidal and benthic environments by diving and dredging and envisaged.
- 435 (6) Introduction to Biological Oceanography – An introduction to the biology of oceans, with supporting coverage of relevant physics and chemistry. Emphasis will be placed on plankton biology, community structure and life histories, and influencing environmental factors. Collections will be made from sheltered inlets, through Barkely Sound to offshore waters. The course will involve both field and laboratory studies of plankton organisms. Prerequisites: BIOL 320, 205, or their equivalents. Credit will be given for only one of MRNE 435 and BIOL 305.
- 440 (6) Biology of Marine Birds – Study of interrelationship of birds and the marine environment. Census techniques and observation of birds in the field will be emphasized. Prerequisite: completion of a course in vertebrate zoology or permission of the Instructor.
- 445 (6) Biology of Marine Mammals – Survey course covering systematics and distribution of marine mammals, their

Marine Science **MRNE**
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- 400 (6) Directed Studies – A course of directed studies under the supervision of a member of faculty. The study will involve a research project approved by the supervisor in the field of interest of the student, and will be designed to take maximum advantage of the laboratory and/or field

sensory capabilities and physiology, with special emphasis on the Cetacea. The course will involve an independent field study. Prerequisite: introductory vertebrate zoology.

- 460 (6) Comparative Erthology – A comparative study of marine animals (vertebrate and invertebrate) emphasizing behavioural description, underlying physiological behaviour mechanisms, the biological significance of behaviour and behavioural evolution. The course will include independent laboratory and field studies.
- 450 (3) Principles of Aquaculture – An interdisciplinary introduction to the principles underlying the commercial cultivation of aquatic plants and animals emphasizing marine systems. The course will include working site visits to a range of commercial farms and R&D facilities.
- 454 (3) Special Topics in Aquaculture – An examination of the culture techniques for selected groups of aquatic plants, animals or micro organisms. Participants will be expected to complete a project which examines some aspect of applied science relevant to commercial culture.
- 460 (3) Special Topics in Aquacultural Applied Science – An examination of the principles underlying the application of selected areas of scientific information to commercial aquaculture. Participants will be expected to complete a written project.
- 470 (3) Directed Research in Aquaculture – Design and execution of a research project in the field of aquaculture under the supervision of a scientist working at the Bamfield Station. A written report is a requirement.
- 500 (6) Directed Studies – Research project approved by the supervisor in the field of interest of the student designed to take maximum advantage of the laboratory and/or field opportunities offered by the Bamfield Marine Station.
- 501 (6) Special Topics – 6 weeks. Offered, as opportunities arise, by distinguished scientists who are visiting at the Bamfield Marine Station. The course will be of a specialized nature.
- 502 (3) Special Topics – 3 weeks. Offered, as opportunities arise, by distinguished scientists who are visiting at the Bamfield Marine Station. The course will be of a specialized nature.

Mathematics and Science Education MAED
SEE CURRICULUM STUDIES, FACULTY OF EDUCATION

Mathematics MATH
FACULTY OF SCIENCE

The first digit in the number of a course is intended to convey the level of mathematical maturity at which the course is conducted rather than the year in which it must be taken.

A student wishing to enter a third year course must have obtained a grade of 51% or better in prerequisite second year courses.

Students who expect to follow an Honours Science program or one with a high mathematical content are urged to apply for admission to MATH 120 and 121.

*For students in the Faculty of Applied Science

Continuing Studies offers MATH 012, a refresher course in pre-calculus material. See Registration Guide, Non-Credit Courses.

Prospective students who have completed or who are registered in a Calculus course in secondary school should refer to the Admissions section of the Calendar under the heading "Credit for Secondary School Calculus Courses."

- 100 (3) Calculus I – Derivatives and antiderivatives of the elementary functions. Applications of the derivative: graphing, max-min problems, and growth-decay problems. Prerequisite: At least a C+ standing in Mathematics 12. [3-1; 0-0] or [0-0; 3-1]

- 101 (3) Calculus II – Antidifferentiation; techniques of integration; definite integrals and applications (e.g. length, moments, etc.); series; Taylor expansions for the elementary functions. Prerequisite: MATH 100, 111 or 120. [0-0; 3-1] or [3-1; 0-0]
- 111 (6) Elementary Calculus – Calculus; topics from algebra, geometry, and trigonometry in the context of calculus. MATH 100 and 111 are equivalent as prerequisites to further courses in Mathematics. Credit will not be given for both MATH 100 and 111. Faculties that require Mathematics 12 for admission to First Year will grant 3 credits only for this course toward a degree. Prerequisite: Mathematics 11 or the equivalent. This course is not open to students with recent credit for Mathematics 12. Students with only Mathematics 11 intending to take MATH 140 and 141 should take MATH 012. [3-1]
- 120 (3) Differential Calculus – Continuous functions, differentiation; graphing, mean value theorem, applications. Prerequisite: Mathematics 12 and permission of the Head of the Department. [3-1; 0-0]
- 121 (3) Integral Calculus – The Riemann integral, techniques Prerequisite: MATH 120, or MATH 100 and permission of the Head of the Department. [0-0; 3-1]
- 130 (6) Finite Mathematics – Intended primarily for students not in the Faculty of Science who wish to have some exposure to mathematical thinking. The course gives an introduction to probability, statistics, linear programming and game theory. Areas of application are chosen mainly from the social and biological sciences. Prerequisite: Mathematics 11. Students who obtain credit for MATH 101 or STAT 203 cannot in the same year or in later years obtain credit for MATH 130. [3-0; 3-0]
- 140 (3) Introductory Calculus I – Derivatives and rates of growth, exponential and circular functions, differentials, chain rule, implicit differentiation, maxima and minima, curve sketching. Not for credit in the Faculty of Science. Credit will be given for only one of MATH: 100, 111, 12 Prerequisite: Mathematics 12. [3-1; 0-0]
- 141 (3) Introductory Calculus II – The definite integral, techniques of integration. Introduction to linear optimization and matrix algebra. Partial derivatives, maxima and minima with constraints. Not for credit in the Faculty of Science. Credit will be given for only one of MATH 101, 121, 141. Prerequisite: MATH 140, 111, or 100. MATH 141 is not acceptable as a prerequisite for MATH 200. [0-0; 3-1]
- 152* (3) Linear Algebra and Differential Equations – Vectors and matrices; dot and cross product; complex numbers; determinants and eigenvalues; linear differential equations and applications. Corequisite: MATH 154. [0-0-0; 3-0-0]
- 153* (3) Differential Calculus – Derivatives and analytic geometry; applications of differentiation to graphing, optimization, growth-decay problems; numerical applications; Newton's method, tangent line approximation and error estimates. Prerequisite: Mathematics 12. [3-1-0; 0-0-0]
- 154* (3) Integral Calculus – Antidifferentiation and techniques of integration; numerical integration; applications of definite integrals (areas, mass, work, first-order differential equations); Taylor series and applications. Prerequisite: MATH 153 [0-0-0; 3-1-0]
- 200 (3) Calculus III – Partial derivatives, total differentials, Chain rule and applications. Path integrals and path dependence. Double and triple integrals. Prerequisite: MATH 101 or 121 [3-0; 0-0] or [0-0; 3-0]
- 210 3 Introduction to Mathematical Computing – Introduction to numerical computation, computer algebra, mathematical graphics. Primarily for second year students taking a degree in mathematics. One hour laboratory each week. Corequisites: MATH 200 (or 206), MATH 221 (or 223), MATH 215. [0-0-0; 3-0-1]
- 215 (3) Elementary Differential Equations I – First-order equations; linear equations; linear systems; trajectory analysis of plane nonlinear systems. Applications of these topics

will be emphasized. Credit will be given for only one of MATH 255 and MATH 215. Prerequisites: MATH 221 (or MATH 223), and a corequisite MATH 200 (or 226). [3-0; 0-0] or [0-0; 3-0]

- 220 (3) Analysis – Sequences and induction; convergence of numerical sequences and series, monotone convergence and Cauchy criterion; limits, continuity and differentiability in one variable. Prerequisite: 64% in MATH 101 or 121 or 200. [0-0; 3-0] or [3-0; 0-0]
- 221 (3) Matrix Algebra – Systems of linear equations, operations on matrices, determinants, eigenvalues and eigenvectors, diagonalization of symmetric matrices. Prerequisite: MATH 101, 121 or 141, or at least 64% in MATH 100, 120 or 140, or advanced credit for MATH 100. [3-0; 0-0] or [0-0; 3-0]
- 223 (3) Linear Algebra – Vector spaces, linear transformations, spectral theory, linear systems, applications. Intended for Honours students. Prerequisites: 68% in MATH 101 or 120 or 121. Credit will be given for only one of MATH 152, 221, 223. [3-0; 0-0]
- 226 (3) Advanced Calculus I – Functions of several variables; limits, continuity, differentiability; implicit functions; Taylor's theorem; extrema; Lagrange multipliers; multiple integration, Fubini's theorem; improper integrals. Prerequisite: At least 68% in MATH 121 or permission of the Head of the Department. Corequisite: MATH 221 or 223. Credit will be given for only one of MATH 200, 226, 253. [3-0; 0-0]
- 227 (3) Advanced Calculus II – Parametrization of curves and surfaces; line and surface integrals; theorems of Green, Gauss, Stokes; applications to physics and/or introduction to differential forms. Prerequisite: 68% standing in MATH 226 or permission of the Head of the Department. Credit will be given for only one of MATH 317, 227, 254. [0-0; 3-0]
- 253* (3) Multivariable Calculus – Partial and directional derivatives; maxima and minima; Lagrange multipliers and 2nd derivative test; multiple integrals and applications. Prerequisite: MATH 154. [3-0-0; 0-0-0]
- 254* (3) Vector Calculus – Space curves and vector differentiation; vector fields; path integrals; surface integrals; the divergence theorem; the theorems of Stokes and Green. Prerequisite: MATH 253. [0-0-0; 3-0-0]
- 255* (3) Ordinary Differential Equations – Review of linear systems; nonlinear equations and applications; phase plane analysis; Laplace transforms; numerical methods. Prerequisite: MATH 152, 154. Corequisite: MATH 253. Credit will be given for only one of MATH 255 or 215. [3-0-0; 0-0-0]
- 257* (3) Partial Differential Equations – Introduction to partial differential equations; Fourier series; the heat, wave and potential equations; boundary-value problems; numerical methods. Prerequisite: MATH 255. Corequisite: MATH 254. Credit will be given for only one of MATH 257 or 316. [3-0-0; 0-0-0] or [0-0-0;]
- 300 (3) Introduction to Complex Variables – Functions of a complex variable, Cauchy-Riemann equations, elementary functions, Cauchy's theorem and contour integration, Laurent series, poles and residues. Corequisite: MATH 317 or 227 or 254. Credit will be given for only one of MATH 300 or 350. [3-0; 0-0] or [0-0; 3-0]
- 301 (3) Applied Analysis – Integrals involving multi-valued functions, conformal mapping and applications, analytic continuation, Laplace and Fourier transforms. Prerequisite: MATH 300. Corequisite: MATH 316 or 257. Credit will be given for only MATH 301 or 350. [3-0; 0-0] or [0-0; 3-0]
- 302 (3) Introduction to Probability – Basic notions of probability, random variables, expectation and conditional expectation, limit theorems. Prerequisite: MATH 200 or 226. MATH 302 and STAT 302 are the same. A student may not obtain credit for more than one of MATH/STAT 205, MATH/STAT 302. [3-0; 0-0] or [0-0; 3-0]
- 303 (3) Introduction to Stochastic Processes – Discrete-time Markov chains, Poisson processes, continuous time Markov

- chains, renewal theory. Prerequisite: MATH 302. [3-0; 0-0] or [0-0; 3-0]
- 307 (3) Applied Linear Algebra – Dependence/independence, bases and orthogonality; linear transformations from \mathbb{R}^n to \mathbb{R}^m ; change of basis; triangularization; quadratic forms in n variables. Prerequisite: MATH 221 or 223. [3-0; 0-0] or [0-0; 3-0]
- 308 (3) Euclidean Geometry – Classical plane geometry, solid geometry, spherical trigonometry, polyhedra, linear and affine transformations. Linear algebra proofs are used. Prerequisite: MATH 221 or 223. It is suggested that MATH 307 be taken concurrently. [3-0; 0-0]
- 309 (3) Topics in Geometry – Topics chosen by the instructor. These may include conic sections, projective configuration, convexity, non-Euclidean geometries, fractal geometry, combinatorial problems of points in the plane. Prerequisite: MATH 308. [0-0; 3-0]
- 312 (3) Introduction to Number Theory – Euclidean algorithm, congruences, Fermat's theorem, applications. Some diophantine equations. Distribution of the prime numbers. Prerequisite: 12 credits of Mathematics courses. [3-0; 0-0]
- 313 (3) Topics in Number Theory – Topics chosen by the instructor. These might include: division algorithms, group theory, continued fractions, primality testing, factoring. Prerequisite: MATH 312. [0-0; 3-0]
- 314 (3) Real Variables – Riemann integral, uniform convergence, interchange of limits, orthogonal functions, other topics. Prerequisite: MATH 220. Credit will be given for only one of MATH 314 and 320. [3-0; 0-0] or [0-0; 3-0]
- 316 (3) Elementary Differential Equations II – Laplace transform; power series methods (ordinary and regular singular points, Bessel's equation); boundary value problems and separation of variables (Fourier series and other orthogonal series), applications to the vibrating string, heat flow, the vibra. Prerequisite: MATH 215. Students lacking MATH 317 are strongly recommended to take MATH 317 concurrently. Credit will be given for only one of MATH 257 or 316. [0-0; 3-0] or [3-0; 0-0]
- 317 (3) Calculus IV – Parametrizations, inverse and implicit functions, integrals with respect to length and area; grad, div, and curl, theorems of Green, Gauss, and Stokes. Prerequisite: MATH 200. Corequisite and recommended prerequisite: MATH 221. [0-0; 3-0]
- 320 (3) Real Variables I – The real number system; real Euclidean n -space; open, closed compact, and connected sets; Bolzano-Weierstrass theorem; sequences and series. Continuity and uniform continuity. Differentiability and mean-value theorems. Prerequisite: 68% overall standing in MATH 226 and 227, or in MATH 200, 317 and 220. [3-0; 0-0] or [0-0; 3-0]
- 321 (3) Real Variables II – The Riemann or Riemann-Stieltjes integrals. Sequences and series of functions, uniform convergence. Approximation of continuous functions by polynomials. Fourier series. Function from \mathbb{R}^m to \mathbb{R}^n , inverse and implicit function theorems. Prerequisite: MATH 320. [0-0; 3-0] or [3-0; 0-0]
- 322 (3) Fundamental Concepts of Algebra I – Groups, subgroups, quotient groups and homomorphisms, direct products, the Sylow theorems, groups of small order. Prerequisite: 68% in MATH 223 or 221. [3-0; 0-0] or [0-0; 3-0]
- 323 (3) Fundamental Concepts of Algebra II – Rings, polynomials, ideals, unique factorization; modules over principal ideal domains, vector spaces, Jordan forms, finitely generated abelian groups; introduction to fields. Prerequisite: MATH 322. [3-0; 0-0] or [0-0; 3-0]
- 331 (3) Problem Solving – Intended for honours students. A seminar on the techniques and art of solving problems based primarily on the mathematics curriculum of the first two years. Prerequisites: MATH 120/121 (or 100/101), 223 (or 221), 226 (or 200). [0-0; 3-0]
- 335 (3) Introduction to Mathematics – Intensive course with required tutorial. Topics selected from combinatorics, probability, geometry and elementary number theory. Credit will not be given for both MATH 335 and MATH 130. Students who obtain credit for MATH 100, 120, 140, or 153 cannot in the same year or in later years, obtain credit for MATH 335. [3-0-2; 0-0-0] or [0-0-0; 3-0-2]
- 340 (3) Introduction to Linear Programming – Linear programming problems, dual problems, the simplex algorithm, solution of primal and dual problems, sensitivity analysis. Additional topics chosen from: Karmarkar's algorithm, non-linear programming, game theory, applications. Prerequisite: MATH 221 or 223. [3-0-0; 0-0-0] or [0-0-0; 3-0-0]
- 345 (3) Applied Mathematics for Continuous Systems – Simple continuous space-time mathematical models of natural and social phenomena and the relevant methods of analysis are studied. Model problems selected from planetary motion, Euler buckling, economic growth, land use in urban planning, traffic flow, waters waves and cell cultures. Mathematical topics include calculus of variation, methods of characteristics, regular and singular perturbation, integral transforms and their asymptotic expansions. Prerequisite: MATH 215. Corequisite: MATH 316 or 257. [0-0; 3-0]
- 350* (3) Complex Variables and Applications – Analytic functions. Cauchy-Riemann equations. Power series and Laurent series. Elementary functions. Contour integrals. Poles and residues. Introduction to conformal mapping. Applications of Analysis to problems in Physics and Engineering. Prerequisites: MATH 254, 255. Credit will not be given for MATH 350 if credit has been given for either MATH 300 or 301. [3-0; 0-0] or [0-0; 3-0]
- 400 (3) Applied Partial Differential Equations – Laplace, wave, and diffusion equations. Conformal mapping with applications in fluid flow. Prerequisite: MATH 301. [3-0; 0-0] or [0-0; 3-0]
- 401 (3) Green's Functions and Variational Methods – Green's functions for partial differential equations. Calculus of variations. Eigenfunction expansions. Rayleigh-Ritz and finite element methods. Prerequisite: MATH 316 or 257, MATH 400. [3-0]
- 402 (3) Calculus of Variations – Classical variational problems; necessary conditions of Euler, Weierstrass, Legendre, and Jacobi; Erdmann corner conditions, transversality, convex Lagrangians, fields of extremals, sufficient conditions for optimality, numerical methods; applications to classical mechanics, engineering and economics. Prerequisite: 68% in MATH 320 or in MATH 301. [3-0; 0-0] or [0-0; 3-0]
- 403 (3) Stabilization and Optimal Control of Dynamical Systems. – Dynamical systems; stability by Liapunov's direct method; controllability and eigenvalue assignment for autonomous linear systems; linear-quadratic regulator, time optimal control. Pontryagin maximum principle, dynamic programming; applications in engineering, economics and resource management. Prerequisites: 68% in MATH 320 or in MATH 301. MATH 402 is recommended. [0-0; 3-0] or [3-0; 0-0]
- 407 (3) Applied Matrix Analysis – Norms and condition numbers of matrices; orthogonal matrices; similarity and congruency transformations; useful matrix decompositions involving orthogonal and triangular matrices; variational characterization of eigenvalues of symmetric matrices; perturbation theory for linear equations and eigenvalues; bounds for eigenvalues including Gerschgorin's theorem. Prerequisite: MATH 307. [3-0; 0-0] or [0-0; 3-0]
- 414 (3) Introduction to Set Theory – Cardinality, ordinals, set-theoretic construction of basic mathematical structures, introduction to axiomatic set theory. Prerequisite: 24 credits of Mathematics. [3-0; 0-0] or [0-0; 3-0]
- 415 (3) Introduction to Mathematical Logic – Predicate calculus, models, theories. Introduction to recursive functions. The Goedel incompleteness theorem. Prerequisite: 24 credits of Mathematics. [0-0; 3-0] or [3-0; 0-0]
- 416 (3) Ordinary Differential Equations – Existence and uniqueness, first order systems, stability, attractors, oscillation and comparison theorems, Sturm-Liouville theory, solution of partial differential equations by separation of variables. Prerequisites: 68% in MATH 215 and MATH 321 [3-0; 0-0] or [0-0; 3-0]
- 417 (3) Partial Differential Equations – Poisson, heat, and wave equations; uniqueness theorems, maximum principle, Green's function, existence for the Dirichlet problem. Cauchy problem for the heat and wave equations, variational principles and generalized solutions, Fourier/Galerkin approximations, Sobolev spaces, spectral theorem, initial boundary value problems. Prerequisites: MATH 416, or 68% standing in MATH 321 and consent of the instructor. [0-0; 3-0] or [3-0; 0-0]
- 418 (3) Probability – Probability spaces, random variables, distributions, expectation, conditional probabilities, generating functions, convergence of random variables, generating and characteristic functions, weak and strong laws of large numbers, central limit theorem. Prerequisite: At least 68% in MATH 321. [3-0; 0-0] or [0-0; 3-0]
- 419 (3) Stochastic Processes – Random walks, Markov chains, branching processes, Poisson processes, continuous time Markov chains, Martingales, Brownian motion. Prerequisite: MATH 418. [0-0; 3-0] or [3-0; 0-0]
- 420 (3) Real Analysis I – Lebesgue measure integration and differentiation; L_p spaces. Prerequisite: At least 68% in MATH 321. [3-0; 0-0] or [0-0; 3-0]
- 421 (3) Real Analysis II – Metric spaces, topological spaces, Banach spaces. Prerequisite: MATH 420. [0-0; 3-0] or [3-0; 0-0]
- 422 (3) Algebra I – Advanced group theory, nilpotent and solvable groups, composition series; field theory and Galois theory. Prerequisite: 68% in MATH 323. [3-0; 0-0] or [0-0; 3-0]
- 423 (3) Algebra II – Representation theory; topics chosen from standing algebraic curves, semi-simple rings, number fields. Prerequisite: MATH 422 [0-0; 3-0] or [3-0; 0-0]
- 424 (3) Classical Differential Geometry – The differential geometry of curves and surfaces in three-dimensional Euclidean space. Mean curvature and Gaussian curvature. Geodesics. Gauss's Theorema Egregium. Prerequisite: At least 68% in MATH 321. [3-0; 0-0] or [0-0; 3-0]
- 425 (3) Introduction to Modern Differential Geometry – Riemannian manifolds, tensors and differential forms, curvature and geodesics. Prerequisite: MATH 424. [0-0; 3-0] or [3-0; 0-0]
- 426 (3) Introduction to Topology – General topology, combinatorial topology, fundamental group and covering spaces, topics chosen by the instructor. Prerequisite: at least 68% in MATH 321 and 323. [3-0; 0-0] or [0-0; 3-0]
- 427 (3) Topics in Topology – Homology theory, homotopy theory, manifolds, and other topics chosen by the instructor. Prerequisite: MATH 426. [0-0; 3-0] or [3-0; 0-0]
- 428 (3) Mathematical Classical Mechanics I – Newton's equation, conservation laws, the Euler-Lagrange equation; Hamilton's principle of least action, Hamilton's equations, Lagrangian mechanics on manifolds. PHYS 306 is recommended as a companion course. Prerequisite: PHYS 206 and MATH 215. Corequisite: MATH 320. [3-0; 0-0]
- 429 (3) Mathematical Classical Mechanics II – Differential forms, symplectic manifolds, canonical transformations, Hamilton-Jacobi equation, integrable systems, Liouville-Arnold theorem, perturbations of integrable systems. Prerequisite: MATH 428. Corequisite: MATH 321. [0-0; 3-0]
- 430 (2-6) c Special Topics in Analysis – The student should consult the Mathematics Department for the particular topics in a given year. [3-0; 3-0]
- 431 (2-6) c Special Topics in Geometry – The student should consult the Mathematics Department for the particular topics offered in a given year. [3-0; 3-0]
- 432 (2-6) c Special Topics in Algebra – The student should consult the Mathematics Department for the particular topics offered in a given year. [3-0; 3-0]

- 440 (3) Complex Analysis – The residue theorem, the argument principle, conformal mapping, the maximum modulus principle, harmonic functions, representation of functions by integrals, series, and products. Other topics at the discretion of the instructor. Prerequisite: MATH 300. [3-0; 0-0] or [0-0; 3-0]
- 441 (3) Modelling of Discrete Optimization Problems – Formulation of real-world optimization problems so they may be tackled by standard techniques such as : linear programming, network flows, integer programming, dynamic programming. Solution by appropriate software. Possible additional techniques: graph theory (e.g., travelling salesman problem, colouring), quadratic programming, game theory. Prerequisite: MATH 340. [3-0; 0-0] or [0-0; 3-0]
- 442 (3) Optimization in Graphs and Networks – Basic graph theory, emphasizing trees, tree growing algorithms, and proof techniques. Problems chosen from: shortest paths, maximum flows, minimum cost flows, matchings, graph colouring. Linear programming duality will be an important tool. Prerequisite: MATH 340. [3-0; 0-0] or [0-0; 3-0]
- 443 (3) Graph Theory – Introductory course in mostly non-algorithmic topics including: planarity and Kuratowski's theorem, graph colouring, graph minors, random graphs, cycles in graphs, Ramsey theory, extremal graph theory. Proofs emphasized. Prerequisite: At least 6 credits of Math courses numbered 300 or above. [3-0; 0-0] or [0-0; 3-0]
- 446 (3) Topics in the History of Mathematics I – Historical development of concepts and techniques in areas chosen from Geometry, Number Theory, Algebra, Calculus, Probability, Analysis. The focus is on historically significant writings of important contributors and on famous problems of Mathematics. Prerequisite: 27 credits in Mathematics. [3-0-0; 0-0-0] or [0-0-0; 3-0-0]
- 447 (3) Topics in the History of Mathematics II – A continuation of MATH 446. Prerequisite: MATH 446. [0-0-0; 3-0-0]
- 449 (2-6) c Honours Seminar – Independent reading by Honours students in Mathematics under the direction of a faculty member.
- 500 (3) Mathematical Logic
- 501 (3) Algebra I
- 502 (3) Algebra II
- 503 (3) Algebraic Structures I
- 504 (3) Algebraic Structures II
- 507 (3) Measure Theory and Integration
- 508 (3) Complex Analysis I
- 509 (3) Complex Analysis II
- 510 (3) Functional Analysis
- 511 (3) Operator Theory and Applications
- 512 (3) Quantum Theory
- 513 (3) Statistical Mechanics
- 514 (3) Ordinary Differential Equations I
- 515 (3) Ordinary Differential Equations II
- 516 (3) Partial Differential Equations I
- 517 (3) Partial Differential Equations II
- 518 (3) Nonlinear Differential Equations
- 519 (3) Fluid Mechanics I
- 520 (3) Fluid Mechanics II
- 521 (3) Numerical Analysis I
- 522 (3) Numerical Analysis II
- 523 (3) Combinational Optimization
- 525 (3) Differential Geometry I
- 526 (3) Differential Geometry II
- 527 (3) Algebraic Topology I
- 528 (3) Algebraic Topology II
- 529 (3) Differential Topology
- 530 (3) Geometric Topology I
- 531 (3) Geometric Topology II
- 532 (3) Algebraic Geometry I
- 533 (3) Algebraic Geometry II
- 534 (3) Lie Theory I
- 535 (3) Lie Theory II
- 537 (3) Algebraic Number Theory I
- 538 (3) Algebraic Number Theory II
- 539 (3) Analytic Number Theory I
- 540 (3) Analytic Number Theory II
- 541 (3) Harmonic Analysis I
- 542 (3) Harmonic Analysis II
- 544 (3) Probability I
- 545 (3) Probability II
- 547 (3) Optimal Control Theory – Optimal control of systems governed by ordinary differential equations. The control problem will be carefully stated, and existence results and necessary conditions will be established. Hamilton-Jacobi-Bellman theory will be introduced.
- 549 (6/12) c Thesis for Master's Degree
- 550 (3) Methods of Asymptotic Analysis – Special functions. Asymptotic expansions, Asymptotic evaluation of integrals. Methods of Laplace, steepest descent and stationary phase. Prerequisites: Applied complex analysis (MATH 301 or equivalent) and ordinary differential equations.
- 551 (3) Perturbation Methods for Differential Equations – Singular differential equations. WKBJ method. Boundary layer theory. Multiple scales. Regular and singular perturbations. Matched asymptotic expansions. Prerequisites: Ordinary and partial differential equations (MATH 400 or equivalent) and MATH 550.
- 552 (3) Introduction to Dynamical Systems – Ideas, methods and applications of bifurcation theory and dynamical systems: differential and difference equations, local bifurcations, perturbation methods, chaos. Prerequisites: MATH 315, 316.
- 553 (3) Advanced Dynamical Systems – Topics from: hyperbolic invariant sets and symbolic dynamics, global bifurcations, local bifurcations for partial differential equations, multiple bifurcations, bifurcations and symmetry, applications. Prerequisite: MATH 552.
- 554 (3) Symmetries and Differential Equations – Dimensional analysis, modelling and invariance. Lie groups of transformations, infinitesimal transformations. Applications to ordinary and partial differential equations. Prerequisites: Elementary courses in differential equations and linear algebra. No knowledge of group theory will be assumed.
- 557 (3) Linear and Nonlinear Waves – Classical and recent results in linear and nonlinear waves. Geometrical acoustics and kinematic waves; large amplitude waves in weakly stratified media; small amplitude waves in strongly stratified media. Dispersive waves; group velocity; applications. Prerequisites: MATH 400 and some knowledge of either fluid mechanics or elasticity.
- 560 (3) Mathematical Biology I – Mathematical methods in modeling biological processes, at levels from cell biochemistry to community ecology. Prerequisites: Completion of an undergraduate degree in Biological, Physical or Mathematical science, including basic training in mathematics and statistics (e.g., STAT 200).
- 561 (3) Mathematical Biology II – Advanced techniques and models in mathematical biology, with applications. Prerequisites: Ordinary and partial differential equations; MATH 560.
- 562 (3) Introduction to Mathematical Neurobiology – Cable theory. Passive and active membrane properties. Action potentials. Hodgkin-Huxley and FitzHugh-Nagumo models. Bursting phenomena. Nonlinear waves in excitable media. Prerequisites: Some background in ordinary and partial differential equations. No background in neurobiology is required. Permission of the instructor.
- 589 (0) M.Sc. Major Essay
- 590 (2-6) c Graduate Seminar- Presentation and discussion of recent results in the mathematical literature.
- 591 (2) Graduate Seminar in Applied Mathematics
- 600 (2-6) c Topics in Algebra
- 601 (2-6) c Topics in Analysis
- 602 (2-6) c Topics in Geometry
- 603 (2-6) c Topics in Topology
- 604 (2-6) c Topics in Optimization
- 605 (2-6) c Topics in Applied Mathematics
- 606 (2-6) c Topics in Differential Equations
- 607 (2-6) c Topics in Numerical Analysis
- 608 (2-6) c Topics in Probability
- 609 (2-6) c Topics in Mathematical Physics
- 610 (2-6) c Topics in Pure Mathematics
- 611 (2-6) c Topics in Functional Analysis
- 612 (2-6) c Topics in Mathematical Biology
- 620 (2-6) c Directed Studies in Mathematics – Advanced study under the direction of a faculty member may be arranged in special situations.
- 649 Ph.D. Thesis.

Mechanical Engineering **MECH**
FACULTY OF APPLIED SCIENCE

- 250 (1) Introduction to Engineering Software – Introduction to general applications software used in mechanical engineering: equation solvers, spreadsheets, data base management, computer-aided drafting. Prerequisites: MATH 152, 154; APSC 151. [0-3*-0; 0-0-0]
- 251 (4) Introduction to Design – Design methodology: the sequence of steps leading from need recognition to a final product. Synthesis as the context of analysis and evaluation of mechanical systems. Case studies and design projects. [0-0; 2-0-3]
- 260 (4) Introduction to Mechanics of Materials – Statically determinate frames and trusses; shear force and bending moment diagrams; theory of beam bending, moment-curvature relation, bending stress, shear stress; torsion of circular rods; transformation of stress and strain in two dimensions, Mohr's circle. Prerequisites: MATH 152, 154 and PHYS 170. [3-0-2; 0-0-0]
- 265 (4) Rigid Body Dynamics – Dynamics of systems of particles. Kinematics of rigid bodies. Kinetics of rigid bodies in two dimensions using equations of motion, and energy and momentum principles. Engineering applications. Prerequisites: MATH 152, 154; PHYS 170. [0-0-0; 3-0-2]
- 270 (4) Thermodynamics – Energy resources: renewable and non-renewable. First law of thermodynamics for control masses and control volumes. Thermodynamic properties of working fluids; state relationships for real and ideal fluids. Combustion, heat exchange, air conditioning, energy conservation to steady and unsteady flows. Second law of thermodynamics: concept of entropy as a property and the limits on natural processes. Application to simple power production and refrigeration cycles. Prerequisite: PHYS 153. [3-0-2; 0-0-0]
- 271 (1) Thermodynamics Laboratory – Experiments which illustrate typical applications of fundamental principles of thermodynamics and heat transfer, including the Otto cycle, Rankine cycle, Brayton cycle and heat pumps. Prerequisite: MECH 270. [0-0-0; 0-3*-0]
- 280 (4) Introduction to Fluid Mechanics – Fluid properties: statics; kinematics, dynamics, energy, and momentum principles for one-dimensional flow; dimensional analysis and similarity; laminar and turbulent flow; pipe flow; principles of turbo-machine flow; forces on bodies in flow. Prerequisites: MATH 152, 253; PHYS 153, 170. [0-0-0; 3-0-2]

- 340 (3) Statics of Marine Vehicles – Hydrostatic curves, transverse and longitudinal stability of surface ships and submarines. Flooding, damaged stability. Launching. Load due to cargo and waves. Prerequisite: Second year Mechanical Engineering program. [3-0-0; 0-0-0]
- 341 (3) Ship Resistance and Propulsion – Elementary theory of ocean waves, dimensional analysis, ship resistance and interference. Ship propulsion methods, propeller theory and design. Prerequisite: Second year Mechanical Engineering program. [0-0-0; 3-0-0]
- 351 (10) Engineering Product Design – Review of design methodology, application to mechanical systems, generation of required motions by cams and four-bar linkages, design and selection of common mechanical components, design for system dynamics. Major design project. Prerequisites: MECH 251, 260. [3-2⁺-3; 3-2⁺-3]
- 352 (4) Design of Mechanical Components – Design of mechanical components to resist static and fatigue failure. Design of welded, bonded and bolted joints. Computer-aided design tools. [0-0-0; 2-0-3]
- 360 (4) Mechanics of Materials I – Beam deflections, column buckling; Castigliano's theorem, statically indeterminate beams, frames and rings; bending of curved beams, bending of beams with asymmetric cross-sections, shear centre; principal stresses and stress invariants in three dimensions; yield and fracture criteria. Prerequisite: MECH 260. [0-0-0; 3-3⁺-0]
- 365 (2) Machine Dynamics and Vibrations – Vibration analysis of single degree-of-freedom systems, energy methods, harmonic, periodic and transient excitation, application to engineering problems. Three-dimensional kinematics and kinetics of rigid bodies, including gyroscopic effects and balancing. Prerequisite: MECH 265 or PHYS 270. [2-0-0; 0-0-0]
- 370 (3) Thermal Systems – Second law of thermodynamics for control masses and control volumes. Existence, evaluation and practical use of entropy. Determination of best possible performance of energy conversion devices. Availability, maximum useful work and chemical equilibrium. Application of second law concepts to the analysis and design of compressors, pumps, turbines, heat exchangers, combustors and to Otto, diesel, gas turbine, Sterling and other engine cycles, power plant design. Prerequisite: MECH 270 or PHYS 156. [0-0-0; 3-0-1]
- 375 (3) Heat Transfer I – Steady and transient one-, two-, and three-dimensional conduction. Analytical and numerical solutions. Application to the design of composite structures, extended surfaces. Radiation heat transfer, blackbody laws, optical properties of surfaces, radiative heat exchange. Convective heat and mass transfer in pipes and from external surfaces; thermal boundary layers, analog between heat, mass and momentum transfer in turbulent flows. Boiling and condensation heat transfer. Application of combined effects to the design of boilers, condensers and heat exchange equipment. Prerequisites: MATH 255; MECH 270 or PHYS 156. [3-0-1; 0-0-0]
- 380 (4) Fluid Dynamics – Review of principles, compressible flow, open-channel flow, potential flow, simple laminar viscous flow, boundary layers, flow around bluff bodies. Prerequisites: MATH 254, 255, MECH 280. [3-2⁺-1; 0-0-0]
- 392 (2) Manufacturing Processes – Manufacturing characteristics of materials and their control. Metal forming processes, plastic deformations, rolling, forging, drawing, extrusion, sheet metal forming, Machining processes and machine tools, turning, milling, drilling, grinding. Metal fabrication, welding and casting. An introduction to process planning. [0-0-0; 2-0-0]
- 405 (3) Acoustics and Noise Control – Wave properties; the decibel; hearing, deafness, and hearing protectors; noise criteria and regulations; sound measurement; sound-source characterization; real noise sources, sound propagation outdoors, in ducts and pipes and in rooms; sound transmission; silencers; sound absorbers; partitions. [0-0-0; 3-1-0]
- 410 (2-6) d Special Topics in Mechanical Engineering – Lectures and readings on specialized topics of current interest in Mechanical Engineering.
- 430 (3) Engineering Data Analysis – The treatment of uncertainty in experimental results, error analysis, single-variable and two-variable experiments. [0-0-0; 3-0-0]
- 431 (3) Engineering Economics – Discounted cash flows. Sources of funds, cost of capital. Effects of depreciation, taxes, inflation. Evaluation and comparison of economic models for engineering projects. Replacement decisions. Public project analysis. Risk analysis. Project control, inventory analysis, simulation. [0-0-0; 3-0-0]
- 441 (3) Computer-Aided Ship Design – Introduction to computer-aided ship design; numerical procedures applied to form, curve fairing, stability, resistance, propulsion, motion manoeuvring and strength. Each student will complete a preliminary design of a conventional ship or, with permission of the instructor, may undertake a preliminary design of a ship intended for special applications. Prerequisites: MECH 340, 341. [0-0-0; 2-2-0]
- 442 (3) Ship Structures and Vibration – Structural theory and practice of ship structural design. Longitudinal and transverse strength of hull girder, bending moment, torsion in a seaway, plate theory, development of ship structural design, pressure hull design and ship building materials. Concepts of ship vibrations and their isolation. [3-0-1]
- 443 (3) Experimental Naval Architecture – The course covers planning and execution of experiments related to marine vehicle resistance, propulsion, seakeeping, structural and hydroelastic systems. Vehicle hydrodynamics as well as experimental methods, data acquisition, processing and interpretation are stressed. Prerequisite: MECH 341. [1-2-1; 0-0-0]
- 453 (2) Friction, Wear and Lubrication – Tribology and its role in mechanical design; surface topography, static and dynamic contact mechanics, mechanisms of friction and wear of materials, lubrication mechanisms, liquid and solid lubricants. Prerequisites: MECH 360, 375. [2-0-0; 0-0-0]
- 454 (2) Fluid Film Lubrication – Physical properties of lubricants, hydrostatic and hydrodynamic lubrication, dynamics of bearings and rotor systems, viscous pumps, compliant surface bearing materials; with applications to design. Prerequisites: MECH 360, 375. [0-0-0; 2-0-0]
- 455 (4) Mechanical Engineering Design Project I – Design project under faculty supervision, intended to provide experience in the design/development of mechanical devices. For students in Co-operative Education Programs. MECH 455 cannot be taken concurrently with MECH 456. [0-4-0]
- 456 (4) Mechanical Engineering Design Project II – Design project under faculty supervision, intended to provide experience in the design/development of mechanical devices. For students in Co-operative Education Programs. MECH 456 cannot be taken concurrently with MECH 455. [0-4-0]
- 457 (8) Mechanical Engineering Design Project – Design project under faculty supervision, intended to provide experience in the design/development of mechanical devices. Prerequisite: third-year Mechanical Engineering. [0-4-0; 0-4-0]
- 460 (3) Mechanics of Materials II – Axisymmetric membrane stresses in thin shells of revolution, stresses in thick-walled cylinders and rotating disks, beams on elastic foundations, axisymmetric bending of cylindrical shells, axisymmetric bending of circular plates. Prerequisite: MECH 360. [0-0-0; 3-0-0]
- 462 (3) Finite Element Analysis – Theory and element selection. Development of computer programs for simple problems. Utilization of existing computer packages. Application to mechanical engineering problems. Prerequisites: MATH 257, MECH 360. [2-2⁺-0; 0-0-0] or [0-0-0; 2-2⁺-0]
- 465 (4) Mechanical Vibrations – Response of multi degree of freedom and continuous systems. Approximate numerical methods. Frequency analysis. Measurement of vibration. Prerequisite: MECH 365. [3-3⁺-0; 0-0-0]
- 466 (4) Automatic Control – Process and system characteristics: transient response; the closed loop; block diagrams and transfer functions; control actions; stability; Nyquist diagrams; Bode diagrams; root locus methods; frequency response; system compensation; nonlinear control systems: digital computer control. Laboratory experiments to support the lecture content. Prerequisites: MECH 365, ELEC 263. [3-2⁺-0; 0-0-0]
- 467 (3) Advanced Dynamics – Advanced topics in vibration analysis, self-excited oscillations, satellite librations, theory of stability, analysis of non-linear systems. Prerequisite: MECH 465. [3-0-0]
- 468 (3) Modern Control Engineering – Introduction to state space control methods for linear systems including modal control, controllability, observability, linear quadratic regulators, optimal control. Prerequisite: MECH 466. [0-0-0; 3-0-0]
- 469 (3) Dynamic System Modeling – Modeling of mechanical, electrical, fluid, and thermal systems: analytical models, model representations such as linear and bond graphs; response analysis; digital simulation. [0-0-0; 3-0-0]
- 470 (2) Thermal Power Generation – Steam power plant cycles, Rankine cycle, reheat and regenerative cycles, component selection. Gas turbine cycles, Brayton cycle, intercooling, reheat and regeneration. Conditions for maximum cycle efficiency. Combined cycles and binary cycles. Nuclear power generation, reactor types and design. Boiler design and selection, boiler codes. Turbomachinery design and selection. Prerequisite: MECH 370. [2-0-1; 0-0-0]
- 473 (2) Heating, Ventilating and Air Conditioning – Principles of air conditioning; psychrometrics and refrigeration. Heat transfer through building materials. Estimation of heating and cooling loads. System design. [2-0-1; 0-0-0]
- 475 (2) Heat Transfer II – Conduction of heat in the unsteady state, periodic heat flow. Graphical and numerical solutions. Radiative heat exchange between gray surfaces. Gas radiation. Free convection from plates and cylinders. Boiling regimes and pressure drops. Mass transfer. Simultaneous heat and mass transfer. Heat exchanger design. Counter, parallel and cross flow heat exchangers. Effectiveness, NTU method. Boilers, condensers and cooling towers. Building heat transfer. Prerequisite: MECH 375. [0-0-0; 2-0-1]
- 481 (3) Aerodynamics of Aircraft I – Low speed aerodynamics of airfoils, wings, wind tunnels. Prerequisites: 2nd class average in 3rd year mechanical engineering program. [3-1⁺-0; 0-0-0]
- 482 (3) Wind Engineering – The special theoretical and experimental problems and methods of aerodynamics relevant to the nature of winds and their steady and oscillatory effects on structures and people; wind energy utilization. Prerequisite: MECH 380. [3-1⁺-0]
- 483 (3) Aerodynamics of Aircraft II – High speed aerodynamics of airfoils and wings; oblique shock waves; method of characteristics. Prerequisite: MECH 481. [0-0-0; 3-1⁺-0]
- 484 (3) Aircraft Design: Aerodynamics – Aircraft performance, stability and control, loading and air worthiness. Detailed example. [2-2-0; 0-0-0]
- 485 (3) Aircraft Design: Structures – Development of aircraft wing structure, moments of inertia for complex shapes, crippling loads, shear lag. [0-0-0; 2-2-0]
- 486 (3) Fluid Flow in Industrial Equipment – Review of pumps, turbines and hydraulic motors. Analysis of piping networks. Pneumatic and hydraulic circuits and components. Flow measurement devices such as flow meters and transducers for measuring velocity and pressure. [3-1⁺-0; 0-0-0]

- 490 (3) Production Engineering – Analysis and modelling of production processes, equipment and facilities with specific emphasis on machine tool operations, process planning, the economics of automation, and selected aspects of production/operations planning. Prerequisite: MECH 392. [3-0-0]
- 491 (4) Computer-Aided Manufacturing – NC programming and machining with APT and interactive graphic systems. Digital logic design, interfacing and assembly programming for manufacturing automation. Design principles of CNC machines, digital control of feed drive servos, real time linear and circular interpolator design techniques. Introduction to unmanned manufacturing. Supplementary tutorial laboratory experiments. Prerequisites: MECH 392, MECH 466. [0-0-0; 3-2⁺-0]
- 495 (3) Industrial Engineering – Man-machine systems. Work measurement. Plant location and layout. Quality control and maintenance. Value analysis. Information processing. Prerequisite: MECH 391. [3-0-0]
- 496 (3) Engineering Management – Organization structures. Management styles. Cost systems and control. Financial statements; accounting procedures. Budgets and performance control. Project management. Human resources management. [3-0-0]
- 501 (3) Thermodynamics – Thermodynamic principles, Maxwell relations, availability, irreversibility and equilibrium. Introduction to statistical mechanics.
- 502 (3) Fluid Mechanics – Governing equations; viscous incompressible flow, incompressible potential flow; incompressible boundary layers, stability and turbulence; compressible potential flow.
- 505 (3) Industrial Acoustics and Vibrations – Fundamentals of acoustics and vibrations, physiologic effects, measurement, instrumentation, interpretation of data, industrial standards and control. For students in Occupational Hygiene; other graduate students may enrol with permission of the instructor.
- 510 (3) Computational Methods in Transport Phenomena I – Finite difference and control volume methods used in the solution of transient and steady state diffusion equations. Heat conduction associated with phase change. Computation of laminar flows. Coupling between momentum, heat, and mass transfer. The Marker and Cell methods and program presentation.
- 511 (3) Computational Methods in Transport Phenomena II – Transport equations in turbulent flows associated with heat and mass transfer. Discretization schemes. Treatment at boundaries. Flow chart and program presentation. Examples of application. Prerequisite: MECH 510 or equivalent.
- 520 (3) Control Sensors and Actuators – Review of control, instrumentation and design. Performance specification of control components, component matching, error analysis. Operating principles, analysis, modelling, design considerations of control sensors and actuators such as analog sensors for motion measurement, digital transducers, stepper motors, DC motors, induction motors, synchronous motors, and hydraulic actuators. Control techniques pertaining to actuators. Applications.
- 540 (3) Marine Hydrodynamics – Fundamentals of model testing, ship frictional resistance. Laminar boundary layer theory, turbulent flow on a flat plate. Ship wave resistance. Thin ship theory. Direct measurement of wave resistance.
- 541 (3) Dynamics of Marine Vehicles – Water waves, motion of a body in an inviscid fluid, concepts of added mass, damping. Uncoupled and coupled motion of platforms, irregular seaway, dynamic effects, motion, stabilization.
- 542 (3) Advanced Marine Vehicles – Design of advanced marine vehicles such as air cushion vehicles, hydrofoils, autonomous underwater vehicles, interfaced vehicles. Principles of operation, stability, powering, control and manoeuvring. Individual or group design exercise.
- 549 (0) Major Essay – For students in the M.Eng. program.
- 550 (2-6) Special Advanced Courses – Special advanced courses may be arranged for a graduate student upon the approval of the Head of the Department. There will not be more than 6 credits in any one such course.
- 551 (8) Advanced Machine Design Project. – The design, analysis, and manufacturability of a selected dynamic machinery assembly will be studied. Prerequisite: 4th year of Electro-Mechanical Design Option. (0-4-2) (0-3-2) (0-3-2)
- 552 (6) Electro-Mechanical System Design Project. – The design and instrumentation of a single board process control device, using standard integrated circuit and electronic devices. Prerequisite: 4th year of Electro-Mechanical Design Option. (0-3-1) (0-3-1) (0-3-1)
- 558 (3) Engineering Applications of Statistical Distributions Theory – Classical and contemporary theory of the prominent statistical models employed in the Applied Sciences. The Normal, Gamma, Beta, and Extreme Value classes of distributions. Estimation techniques and applications to engineering problems. Prerequisite: MECH 390 or STAT 251.
- 561 (3) Linear Elasticity – Stress and strain in three dimensions, fundamental field equations of linear elasticity; equilibrium, compatibility, Hooke's law; Papkovitch-Neuber solution, plane stress and plane strain; torsion, torsion of thin-walled members with warping restraint; plate theory. Same as CIVL 529; credit will be given for only one of MECH 561 and CIVL 529.
- 562 (2) 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 materials, plastic yield conditions and associated flow rules.
- 563 (2) Robotics: Kinematics, Dynamics and Control – Definitions and classification. Kinematics: homogeneous transformations, manipulator kinematic equations, forward and inverse kinematic solution methods, differential kinematic equations, motion trajectories. Dynamics: Lagrange-Euler formulations, Newton-Euler formulation. Control: methods of control, robot control hierarchy, control of single joint and multiple link manipulators, advanced control methods.
- 564 (6) Space Dynamics I – Dynamics of systems with variable mass, optimization of rocket performance; orbital mechanics, transfer of orbit and rendezvous; theory of patched conics for interplanetary travel; geometry of spatial orbit, orbit determination using Gauss, Laplace and Gibbs methods, introduction to gyrodynamic, theory of stabilized platforms.
- 565 (2) Linear Vibrations I – Transient and steady-state response of lumped parameter systems; shock response; integral transform and energy methods; electrical analogies; approximate solutions; mechanical impedance and mobility; vibration measuring instruments and systems.
- 566 (2) Linear Vibrations II – Response of continuous elastic systems such as rods, beams, frames, plates, shells; exact solutions; Rayleigh and Rayleigh-Ritz approximations; numerical and experimental methods.
- 567 (2) Nonlinear Elasticity – Fundamentals of tensor calculus, covariant differentiation of tensors of general order, applications to continuum mechanics. Stress and strain tensors, equations of motion for elastic materials and viscous fluids in general curvilinear coordinate systems. Solution of special problems in finite elasticity.
- 568 (2) Theory of Plasticity – Yield conditions and flow rules; upper and lower bound theorems; elastic-plastic analysis of circular disks, thick-walled cylinders and spheres; torsion; slip-line fields; rigid-plastic analysis of plates and shells.
- 569 (2/4) d 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 (6) Space Dynamics II – Three body and multibody systems, stability of motion near Lagrange points; orbit perturbations due to Earth's oblateness and atmosphere, estimation of satellite lifetime; active and passive stabilization of space vehicles, environmental effects on satellite vibrations and station keeping.
- 571 (2) Turbomachinery – Classification and performance of turbomachinery; momentum and energy transfer; 2-D cascade theory and measurements; axial-flow turbines and compressors; radial flow machines; 3-D flow and unsteady flow in turbomachinery.
- 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. Mass transfer.
- 573 (2) 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 (2) Special Topics in Solar Energy Utilization – Transmission of solar radiation through partially transparent materials. Focussing collectors. Solar thermal conversion. Modelling of solar heating of buildings and heating of industrial water. Solar thermal storage; materials, systems and optimization. Prerequisite: MECH 474, CPSC 350.
- 575 (1-3) c Special Topics in Heat and Mass Transfer.
- 576 (2) Combustion – Thermodynamics of combustion, stoichiometry, heat of formation and reaction. Equilibrium composition and adiabatic flame temperature. Chemical kinetics of combustion. Flames in premixed gases; laminar and turbulent flame propagation. Diffusion flames, pollutant emissions and combustion in IC engines.
- 577 (3) Applied Statistical Thermodynamics – Application of the concepts of quantum mechanics, statistical mechanics, and kinetic theory to the evaluation of thermodynamic and transport properties and equilibrium constants. Investigation of the combustion phenomena from a microscopic point of view. Use of statistical thermodynamic methods for evaluating the product distribution energy release, temperature and effective properties in high temperature combustion situations.
- 579 (1-3) c Engineering Solar Radiation – Measurement of the extraterrestrial spectral and total irradiance. Scattering and absorption of radiation by gas molecules and aerosols. Spectral and total solar irradiance under cloudless skies. Computation of solar radiation entering buildings, greenhouses and solar energy collecting devices. Natural illumination of buildings. Spectral and total irradiance of animals and plants. Photosynthetic light. Topics to suit the special interests of students.
- 580 (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; free streamline flows; vortex motions.
- 585 (6) 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.
- 586 (4) Turbulent Shear Flow – The basic equations of fluid motion; introduction to hydro-dynamic stability; Reynolds' equations; energy equations for turbulent motion; intermittency; similarity near a solid boundary and in free turbulence; approximate methods for predicting the growth of turbulent boundary layers and free symmetrical shear flows.

- 587 (3) Fracture Control for Design – Transition temperature, linear-elastic and elastic-plastic theory, experimental testing methods, fracture-resistant design methodology, application to mechanical and structural components.
- 588 (3) Fatigue – Review of smooth-body fatigue; high-cycle; low-cycle; cumulative damage; cycle counting methods, cracked-body fatigue theory; effects of load history and stress ratio; numerical crack-growth prediction models; application to components and structures; crack detection methods.
- 590 (3) Manufacturing Automation – Review of mechanics of metal cutting, Machine tool structures, static deformations, forced and self-excited vibrations and chatter. Design principles of CNC machines; state space and transfer function models of feed drivers, d.c. servo motors and amplifiers. Contouring analysis in multi-axes machining, Unmanned manufacturing topics: Sensors, adaptive control and monitoring in metal-removing processes.
- 595 (2) Systems Modelling and Simulation – Modelling of discrete and continuous systems on digital computers. Application of discrete simulation languages to the analysis and design of service and manufacturing systems. Statistical concepts in analysis and validation. Application of continuous simulation languages to the analysis and design of dynamic and control systems. Integration methods and algorithms, optimization and iterative problems.
- 597 (6) Project for M.Eng. Studies – Project on assigned topic of specialization. For students registered in the M.Eng. program whose project is supervised by a faculty member in the department of Mechanical Engineering.
- 598 (2) Seminar – Presentation and discussion of current topics in mechanical engineering research.
- 599 (6-12) c Thesis – For M.A.Sc. degree.
- 699 Thesis – For Ph.D. degree.

Medical Genetics MEDG
FACULTY OF MEDICINE

See also courses listed under Genetics.

- 410 (3) Immunogenetics – A lecture course covering current topics in immunogenetics including molecular genetics of antibody diversity, genetics and evolution of the major histocompatibility complex, immunodeficiency diseases and antigenic variation in human pathogens. Emphasis will be on human immunogenetics. (Same as MICB 402.) Prerequisites: BIOL 334 or equivalent and MICB 302 or permission of the instructor. [0-0; 3-0]
- 419 (3) Human Cytogenetics – A lecture course with laboratory demonstrations dealing with human chromosome variation as it relates to disease. Topics will include chromosome banding techniques, structural and numerical chromosome anomalies, the etiology of chromosome errors and their effect on development, somatic aberrations and population cytogenetics. Prerequisite: BIOL 334. [3-0; 0-0]
- 420 (3) Human Biochemical and Molecular Genetics – Normal and pathological human variation. Detection, mapping, isolation and analysis of mutant human genes and consequent disruption of normal biochemical processes. Prerequisites: BIOL 335 and BIOC 300, or equivalent. [3-0; 0-0]
- 421 (3) Biology and Genetics of Neoplasia – A lecture course reviewing a wide range of topics related to cancer: biology and immunology of tumor cells, chemical and viral carcinogenesis, oncogenes and genetic predisposition, mechanisms of abnormal growth regulation, principles of cancer treatment. Prerequisite: Biol 334. [0-0; 3-0]
- 434 (3) Population Genetics – Fundamental aspects of population and quantitative genetics with emphasis on experimental observation and examples from natural populations. The distribution of genetic variance in the human species is especially emphasized. Prerequisite: Permission of an instructor or BIOL 334, AGSC 213, FRST 302, or equivalent. (Same as BIOL 434). [0-0; 3-0]

- 440 (3) Medical Genetics – A course of lectures and demonstrations outlining the fundamental principles of genetics as they relate to medical practice. Restricted to students in the Faculty of Medicine and others with the permission of the Department Head.
- 448 (3/6) c Directed Studies – A supervised individual program of study of a topic to be agreed upon by a member of faculty and the student. Permission of the appropriate supervisor and the Head of the Department is required.
- 505 (3) Genome Analysis – Investigation of genetic information as it is organized within genomes, genetic and physical map construction, sequencing technologies, gene identification, database accessing and integration, functional organization of genomes from contemporary, historic and evolutionary perspectives. Prerequisite: BIOL 334 and BIOL 300 or equivalent.
- 510 (3) Advanced Immunogenetics – Cell-cell interaction, intracellular control mechanisms, analysis of complex physiological systems using transgenic animals and molecular approaches. (Same as MICB 502.) [0-0; 3-0]
- 520 (3) Advanced Human Molecular Genetics – Genetic variation, genome analysis, cloning of genes for diseases and normal functions, mutation detection, animal models of human genetic disease. Prerequisite: BIOL 334. [3-0; 0-0]
- 521 (3) Biology and Genetics of Neoplasia – Same as MEDG 421, with additional seminars for graduate students on current research topics. (Same as PATH 531. Credit will be given for only one of MEDG 421, MEDG 521 or PATH 531.) Prerequisite: BIOL 334 and permission of instructor. [0-0; 3-0]
- 530 (6) Advanced Human Genetics – Human cytogenetics, Mendelian and non-Mendelian inheritance, polymorphisms, human population genetics, developmental genetics, cancer genetics, behavioral genetics, genetics and evolution, clinical applications of genetics. Prerequisite: BIOL 334. [3-0; 3-0]
- 540 (3) Seminar – All seminars will be presented by graduate students in the Department of Medical Genetics. Although students will be encouraged to attend these seminars throughout their graduate studies, credit will only be available for one year. [1-0; 1-0]
- 548 (2-6) c Directed Studies – A series of laboratory sessions, directed readings and directed counselling interviews related to selected areas of Medical Genetics. This advanced course may be taken upon approval of the Head of the Department.
- 549 (12) M.Sc. Thesis
- 550 (6) Concepts in Clinical Genetics for Genetic Counselling – Practical applications of medical genetics; principles, theories and application of counselling; the normal development, structure and function of the anatomical systems of the body, and the genetic conditions which can affect each system; legal, ethical and social issues as they relate to genetic counselling.
- 560 (2) Genetic Counselling Seminar – Medical and genetic interviewing and family history taking; decision making; family dynamics; impact of congenital defects, genetic disease, and chronic disease on individuals and families; support groups and other community resources; computer resources; cross-cultural issues.
- 565 (2) Advanced Genetic Counselling Seminar – Patient attitudes toward genetic counselling; the grieving process in response to pregnancy loss, death and disability; risk perception, attitudes toward prenatal testing, dealing with results of genetic testing, crisis counselling, giving bad news; ethical dilemmas; legal and professional issues.
- 570 (3) Introductory Clinical and Laboratory Rotation – Clinical experience in prenatal procedures and counselling; teratogen counselling. Clinically relevant experience in cytogenetics, molecular, biochemical disease and embryopathology laboratories.
- 575 (10) Advanced Clinical Rotation – In-depth clinical experience in general and prenatal genetic counselling.

- 649 (0) Ph.D. Thesis
- 702 Clinical Genetics Clinic – A rotation for three months through the Clinical Genetics Clinic dealing with the techniques of diagnosis and counselling, and of the prenatal diagnoses of genetic disease and genetic counselling relative to congenital malformations and failures of reproduction.

Medical Microbiology MMB
DEPARTMENT OF PATHOLOGY AND LABORATORY
MEDICINE, FACULTY OF MEDICINE

- 327 (6) Bacteriology, Mycology, Virology and Parasitology.

Medicine MEDI
FACULTY OF MEDICINE

- See also courses listed under: Anatomy, Biochemistry, Family Practice, Health Care and Epidemiology, Health Sciences History of Medicine, Interdepartmental, Medical Genetics, Medicine, Microbiology, Obstetrics and Gynecology, Ophthalmology, Orthopaedics, Paediatrics, Pathology, Pharmacology and Therapeutics, Physiology, Psychiatry, Radiology, Surgery
- 425 (6) 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.
- 450 (16) Principles of Medicine – 1. Systematic lectures are given by members of the department in conjunction with members of other departments under the direction of committees arranging these presentations of disorders in the following groups—cardiovascular disease, dermatology, endocrinology and metabolic disease, gastroenterology, haematology, neurology, renal disease, respiratory disease, rheumatic disease and allergy-immunology. 2. Bedside clinical instruction and individual work on the medical wards are undertaken in which students record case histories and examinations of patients. 3. Ambulatory clinical instruction and individual work in ambulatory teaching clinics are undertaken in which students record case histories and examination of patients.
- 451 (3) Teaching in Medicine – Educational concepts and principles relative to planning and effectively conducting lectures, group discussions, case presentations, bedside clinics, and 1:1 teaching. Elective for third-year medical students.
- 452 Laboratory Medicine – A course of lectures, laboratory periods and demonstrations in which laboratory diagnosis in clinical medicine is studied. The clinical application and significance of laboratory procedures are emphasized. First term.
- 453 (3) Introduction to Electrocardiography – Patterns of electrical activity of the heart in electrocardiograms of normal subjects using the vector approach, and their aberration by pathological states. Elective for third-year medical students.
- 475 (18) Medicine-Clinical Clerkship – This consists of a period of twelve weeks in which the student is attached to a clinical teaching unit. During this time the student will carry out under supervision clinical activities of examination and study of patients, and participate in the discussion and management of the problems they present. Opportunities for work in the outpatient department and emergency service is provided. Opportunity for election to work in a speciality field is afforded.
- 501 (3) Molecular and Cellular Biology of Experimental Medicine – Cell and molecular function in normal tissues and in specific disease processes, including, genetic, viral, bacterial, immune, and physiological disorders.
- 502 (3) Experimental Medicine Methodology – Laboratory experience with experimental models of human disease: critical reviews of their relevance, Laboratory rotations, oral presentations and written reviews. Registration requires permission of the Department.

- 510 (3) Nephrology – Mechanisms of regulation of acid-base balance, fluid and electrolyte content, excretion of proteins and organic substances in kidney disease; abnormal renal mechanisms in hypertension.
- 520 (6) Health Sciences for Biomedical Engineers – Principles of anatomy and physiology as applicable to biomedical engineering.
- 530 (3) Gastroenterology – Pathogenesis and abnormal physiology in disease of the intestine and accessory organs; carcinogenesis; regulatory peptides; liver disease; inflammatory bowel disease; oesophageal dysfunction.
- 535 (3) Research Seminar – Reviews of research in selected areas of experimental medicine, including presentation of student's own research results.
- 540 (3) Advances in Neurology – Pathogenesis and immunological mechanisms in acute and chronic virus infections of the central nervous system; immunologically induced non-infectious neurological disease.
- 548 (2-6) d Directed Studies in Experimental Medicine
- 549 (12) M.Sc. Thesis
- 560 (3) Pulmonary Pathophysiology – (Same as PATH 518.)
- 570 (3) Cardiology – Pathogenesis, abnormal physiology and therapeutic approaches in heart disease including cardiac arrhythmia, heart failure, myocardial infarction, hypertension, atherosclerosis.
- 580 (3/6) c Experimental Medicine: Infectious Diseases – Supervised individual program of directed studies in experimental aspects of pathogenesis, diagnosis and treatment of infectious diseases, and mechanisms of host defence against microbial infections. Prerequisite: PATH 427 or equivalent.
- 590 (3) Molecular Regulation of Cell Growth and Differentiation – Cytokines and signal transduction mechanisms in the growth and differentiation of germ line, haemopoietic and other eukaryotic cells; actions of oncogene and tumour-suppressor gene products; molecular concepts derived from experimental model systems; molecular concepts derived from experimental model systems; molecular strategies of cytokine therapy. Prerequisites: MICB 302, BIOC 402, 403 or permission of course coordinator.
- 649 Ph.D Thesis
- 700 Medical Rounds – One hour weekly Departmental Grand Rounds at which educationally important cases or subjects are discussed in depth, both from the clinical and scientific viewpoints, and also one hour weekly Ward Rounds at which problems or especially interesting cases are discussed under the supervision of the Head of the service.
- 701 Lecture Course – One hour weekly lecture presented by faculty members at which the knowledge of basic sciences is applied to the understanding of disease processes, in the field of General Internal Medicine and its subspecialties.
- 702 Seminar-Conference – Formal preparation and presentation of topics in small group discussions, one hour weekly.
- 703 Directed Studies in Clinical Medicine – Supervised investigative or academic work under a designated faculty member.
- 710 Nephrology Rounds – Discussion of clinical and scientific aspects of educationally important cases six times monthly.
- 711 Renal Biopsy Rounds – Weekly correlation between clinical status and pathological findings in several patients. (Same as PATH 709.)
- 712 Nephrology Seminar – Formal preparation and presentation of topics in small group discussions. 1 hour weekly.
- 713 Directed Studies in Nephrology – Supervised investigative or academic work under a designated faculty member.
- 720 Clinical Geriatric Medicine – Clinical experience under supervision in the assessment and treatment of elderly patients in a Day Hospital setting, an in-patient assessment and treatment unit, and on an acute hospital geriatric consultation service.
- 721 Psychiatric Aspects of Geriatrics – Clinical experience under supervision in the assessment and treatment of psychiatric problems of elderly patients in multiple health settings including inpatient and outpatient consultation services, acute hospital in-patient units, short stay assessment and treatment units and speciality clinics such as the Alzheimer's Clinic.
- 722 Long Term Care (Geriatric Medicine) – Clinical experience under supervision in the management of long term care of elderly patients emphasizing clinical care, interprofessional relationships, and interaction with caregivers and community groups.
- 723 Geriatric Grand Rounds – Lecture or case presentations of current topics or advances in geriatric medicine followed by discussion. One hour twice monthly.
- 724 Geriatric Journal Club – Review and discussion of important problems in the care of the elderly based on review and presentation of important current journal articles. One hour monthly.
- 725 Geriatric Seminar Topics Series – A scientific review of major problems encountered in the care of the elderly including a literature review incorporating the most recent information as a basis for continuing discussion of these topics. Two hours monthly.
- 636 (2) Transport Phenomena II. – Diffusion and mass transfer with chemical reaction; gas-liquid, gas-solid and liquid-liquid systems; analysis of mass transfer processes in metallurgical operations; mixing in continuous and batch processes. Prerequisite: MMAT 263 [2-0-0]
- 365 (3) Mechanical Behaviour of Materials. – Polycrystalline and single crystal deformation; dislocation theory; strengthening mechanisms; fracture mechanics; fatigue; high temperature deformation mechanisms. (3-0-0)
- 376 (4) Structure and Properties of Steel – The relationship between structure and properties of ferrous alloys; carbon, and alloy steels; principles of heat treatment: high strength steels. [3-3*-0]
- 377 (2) Engineering Alloys – The relationship between structure and properties in stainless steel and non-ferrous alloy systems; alloy specification and design criteria. Prerequisite: MMAT 376. [2-0-0]
- 378 (2) Phase Transformations – Solidification and solid state transformations; nucleation and growth processes; segregation and structure in castings; phase changes in steel; diffusion equations. [2-0-0]
- 380 (3) Structure and Properties of Materials – Strengthening mechanisms; heat treatment and properties of steel and other alloys; metal failures. (A service course for Mechanical Engineering.) Prerequisite: APSC 278. [3-0-0]
- 382 (4) Ceramics I – Properties and processing of ceramics; crystal structures; sintering; raw materials; application of phase diagrams. (3-3*-0)
- 390 (1) Seminar I – Training and practice in public speaking and presentation of technical papers. [0-0-1; 0-0-1]
- 391 (2) Polymers I – The chemical structure of polymers; thermal properties; mechanical properties; processing of polymers; fabrication processes; design considerations. [2-0-0]
- 398 (1) Engineering Report – All students entering third year Metals and Materials Engineering are required to write two reports, one based on a field trip. Detailed information on form, content and dates for submission of preliminary and final copies is available in the office of the Head of the Department.
- 450 (4) Metallurgical Thermodynamics II – The application of thermodynamics to metallurgical processes: thermochemistry of gas mixtures, solution thermochemistry, inter-action parameters, chemical potential and free energy diagrams applied to metallurgical processes and thermodynamic modelling. Prerequisite: MMAT 350. [3-0-2]
- 452 (2) Iron and Steelmaking – Technology and economics of iron and steelmaking; direct reduction, basic oxygen processes; arc furnaces; process sequences; capitalization, structure and economics of the industry. Prerequisite: MMAT 350. [2-0-0]
- 454 (2) Reactive Metal Processing – Extraction and refining of reactive metals; aluminium, titanium, uranium and rare metals; process chemistry, technology and economics. Prerequisite: MMAT 452. [2-0-0]
- 456 (2) Corrosion Engineering – Thermodynamics of corrosion (Pourbaix diagrams); kinetics of corrosion (polarization curves); practical aspects of corrosion. [2-0-0]
- 458 (2) Hydrometallurgy – Leaching, purification, precipitation, regeneration; thermodynamics and kinetics of separation steps; electrochemical applications. Prerequisites: MMAT 352 and 456. [2-0-0]
- 462 (2) Process Modelling – Mathematical modelling of metallurgical processes using principles of heat, mass and momentum transfer; numerical methods applied to process modelling; melting and solidification processes; controlled heating and cooling operations. Prerequisites: MMAT 360 and 362. [2-0-0]
- 472 (3) Welding and Joining – Principles of fusion welding, solid state welding, brazing, adhesive bonding, and other processes for joining metals. Metallurgy of welding. Stresses

Medieval Studies**MDVL****FACULTY OF ARTS**

See Medieval Studies under Programs in the Faculty of Arts for other acceptable courses.

- 200 (6) Introduction to the Middle Ages – Selected topics (e.g. Age of Charlemagne, Twelfth-Century Renaissance) studied from an interdisciplinary approach designed to integrate the major areas of history, literature, and art; topics vary from year to year; interested students should consult the Medieval Studies adviser, Department of History. [2-1; 2-1]

440 (3/6) d Medieval Seminar [0-2 or 0-2; 0-2]

449 (6/12) c Graduating Essay or Supervised Study

Metals and Materials Engineering**MMAT****FACULTY OF APPLIED SCIENCE**

- 250 (4) Metallurgical Thermodynamics I – Thermodynamic and electrochemical principles applied to metallurgical processes; phase rule, heat of reaction, free energy, activity, thermodynamic equilibrium; thermodynamics of aqueous solutions. [3-0-2]
- 252 (4) Pyrometallurgy I – Process flow sheets for ferrous and non-ferrous metal extraction; mass and energy conservation; roasting and smelting; refractory properties. [2-3*-2]
- 263 (4) Transport Phenomena I – Fluid Mechanics; laminar and turbulent flow; boundary layers; flow in conduits and fluidized beds; flow measurements. Heat transfer; conduction through solids. [3-0-2]
- 280 (3) Materials in Design – The process of materials selection for different design criteria; the importance of shape and processing variables; the use of computer software in the selection process. [2-0-3]
- 351 (3) Hydrometallurgy. – Aqueous extraction of metals from ores and concentrates for MMPE students. (3-0-0)
- 358 (4) Hydrometallurgy I. – Aqueous extraction of metals from ores and concentrates. (3-3*-0)
- 361 (3) Application of Numerical Methods to Materials Engineering – Selected examples in materials engineering will be employed to demonstrate the use of numerical integration and differentiation; the use of numerical methods to solve non-linear, ordinary and partial differential equations which stem from standard practical problems. A two hour problem session will provide the students with hands-on experience at programming algorithms. [2-0-2]

- and distortion in welding; welding design. Prerequisite: MMAT 376. [2-3*-0]
- 474 (2) Mechanical Working – Effect of temperature, strain rate, state of stress and structure on the deformation behaviour of metals and alloys at large strains. Criteria for workability of metals. Applications to the analysis of such hot and cold working processes as forging, rolling, extrusion, deep drawing, wire and tube drawing. Friction and lubrication in metal working. [2-0-0]
- 478 (2) Electronic Materials – Materials aspects of the production of semiconductor and optical devices will be considered including bulk semiconductor crystal growth, epitaxial growth, crystal imperfections, impurity effects, ion implanting and fabrication. Characterization of the material by analytical, electron optic and optical devices. The relationship of material characteristics and electrical properties. [2-0-0]
- 479 (2) Failure Analysis – Case studies of typical failures of engineering systems and components from a perspective of the fundamental properties of the metals and materials used. The importance of proper design and materials selection. Emphasis placed on failures in the pulp/paper, petroleum and marine service industries. Prerequisite: MMAT 377 or MMAT 380. [2-0-0]
- 480 (2) Fracture – Ductile and brittle fracture; creep; fatigue; stress corrosion; behaviour of composites; service failures of components and structures, and related topics. [2-0-0]
- 482 (3) Ceramics II – Crystalline non-metallic solids, silicates, amorphous phases, phase changes, microstructure and properties such as thermal conductivity, thermal stress, electrical conductivity. [3-0-0]
- 483 (2) Processing of Ceramics and Composites – The techniques of processing ceramics and composites into finished products. Topics include raw materials, fabrication, testing and evaluation. [2-0-0]
- 484 (2) Refractory Practice and Problems in Metallurgical – Deals with detailed refractory applications in metallurgical furnace requirements, specifications and causes of failure. Examples of problems and their solutions will be illustrated. New developments in refractory practice will be outlined. Prerequisite: MMAT 382. [2-0-0]
- 486 (2) Nondestructive Evaluation. – Principles of test methods; inspection techniques and equipment; quantitative flaw evaluation; reliability analysis. [2-0-0]
- 488 (2) Strengthening in Alloy Systems – Solid solution hardening; precipitation hardening; strain hardening in metals and alloys; structural hardening in steels; thermomechanical processing. [2-0-0]
- 490 (1) Seminar II – Training and practice in public speaking and presentation of technical papers. [0-0-1; 0-0-1]
- 492 (2) Powder Metallurgy – Production and properties of particulate metals, compaction and other shaping processes; sintering of single and multicomponent powder systems; liquid phase sintering and infiltration applications. [2-0-0]
- 493 (2) Quality Engineering – Modern quality concepts and trends; application of statistics; quality assurance management systems; ISO 9000 series interpretation; inspection and testing. [2-0-0]
- 494 (2) Composite Materials I – An introductory course dealing with fibres and resins; fabrication processes; properties of composites as laminae and laminates; designing with composites. [2-0-0]
- 495 (3) Metallurgical Laboratory – Experiments and problems illustrating the principles and practice of chemical and physical metallurgy. [0-5-0]
- 498 (1) Engineering Report – All students in fourth year Metals and Materials Engineering are required to write two reports, one based on a field trip. Detailed information on form, content and dates for submission of preliminary and final copies is available in the office of the Head of the Department.
- 499 (3) Design or Research Project – The student will have a choice between studying a selected problem in applied metallurgical research or in the analysis and design of a metallurgical process. [0-3-0; 0-3-0]
- 550 (2-4) c Metallurgical Thermodynamics – Application of advanced thermodynamic principles in metallurgical processes. Prerequisite: MMAT 450.
- 552 (2) Advanced Solidification Processing – Structure and quality in casting processes. Continuous casting of steel; direct chill casting of non-ferrous metals; near-net-shape casting; single crystal growth. Heat flow; fluid flow; development of cast structure; stress analysis.
- 554 (2/4) c Hydrometallurgy – Modern theories of comminution, leaching, purification and precipitation processes. Four credits will be given when the student undertakes an extra project.
- 556 (2) Advanced Process Metallurgy – Topics in advanced process metallurgy including: metallurgy of rarer metals, vacuum and inert atmosphere processing, halide metallurgy, fused salt processes, iron and steelmaking. Prerequisite: MMAT 451.
- 557 (2/4) c Separation Science in Aqueous Metal Processing – The theory of solvent extraction and ion exchange, membrane separations, chemical precipitation, electrochemical separations and other techniques for aqueous metal processing will be discussed. Numerous applications from the metal processing literature will also be examined. Four credits will be given when the student undertakes an extra project.
- 558 (2) Corrosion – Modern theories relating to corrosion and corrosion protection of metals. Thermodynamic and kinetic phenomena, corrosion measurements, inhibition and passivation, design for corrosive environments, stress corrosion cracking theory. Prerequisite: MMAT 456.
- 560 (2) The Analysis and Design of Metallurgical Processes. – Analysis of processes using mathematical modelling and numerical analysis. Vacuum refining, continuous casting, blast furnace, gas-solid reactions. Prerequisites: MMAT 360 and 362.
- 562 (2) Finite Elements in Heat Transfer – Application of the finite element method to heat transfer and solidification; steady state and transient heat conduction; latent heat evolution and radiation. Prerequisite: CIVL 557.
- 570 (4) Structure of Metals II – Nature and properties of lattice imperfections; dislocation theory and its use to describe work hardening, creep, structure of grain boundaries and other phenomena.
- 571 (2) Solidification – Advanced topics in solidification. Theories of solidification: eutectic and polyphase solidification; solid-liquid interface morphology; macrosegregation and inverse segregation in castings; microsegregation, homogenization of castings.
- 573 (2) Topics in Metals and Materials Processing – Current research topics in the field of metals and materials processing.
- 574 (2) Topics in Physical Metallurgy – Topics of metallurgical interest in the field of physical metallurgy to be selected for discussion.
- 575 (2) Phase Transformations in Solids – Mechanisms and modelling of transformations associated with the heat treatment of steels. Prerequisite: MMAT 378.
- 577 (2) Failure Analysis – Procedures used in the analysis of system and component failures in service. Identification of failure type and sequence. Corrective design procedures. Case studies of failures with major emphasis placed on problems associated with the pulp/paper and oil/Prerequisites: MMAT 377 or 380.
- 581 (2) 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.
- 582 (2) Advanced Ceramics – Complex silicate structures; ion exchange in silicates; kinetics of solid state reactions; kinetics of high temperature processes.
- 583 (2) Non-Crystalline Materials – The structure and properties of non-crystalline materials. Chemistry of inorganic glasses, phase separation and crystallization of glass, vitreous carbon, amorphous solids, glass-forming liquids. Emphasis on relations between structure and properties.
- 585 (2) Topics in Fracture Mechanics – The equations and concepts of linear elastic fracture mechanics. Fracture toughness testing, statistical theories of fracture and proof testing, stress corrosion cracking and static fatigue. Acoustic emission and other nondestructive testing methods. Case studies of large scale fractures of pressure vessels and structures.
- 586 (2) Electron Metallography – The principles of advanced research microscopy utilizing electron beams; transmission and scanning electron microscopy, electron diffraction, X-ray micro-analysis, electron energy analysis.
- 592 (2-6) c Special Topics in Metallurgy – A special advanced course may be arranged on approval of the Head of the Department.
- 594 (2) Composite Materials II – Mechanical behaviour of composite materials; tensile and compressive characteristics, toughness; fatigue; impact; environmental effects. Prerequisite: MMAT 494.
- 596 (12) M.Sc. Thesis
- 597 (6) M.Eng. Project
- 598 Seminar – Presentation and discussion of current topics in metals and materials research. A required course for graduate students in metals and materials which carries no academic credit.
- 599 (12) Thesis – For M.A.Sc. Degree. Research studies in chemical metallurgy, physical metallurgy, or ceramics.
- 699 Thesis – For Ph.D. degree.

Microbiology **MICB**
DEPARTMENT OF MICROBIOLOGY AND
IMMUNOLOGY, FACULTY OF SCIENCE

**Additional fees are charged for these courses. See Index "Fees - Special Fees".

- 153 (3) Applied Microbiology – The general principles involved in the study of microorganisms and their relation to human health. The epidemiology of disease and the measures to prevent the transmission of pathogenic organisms will be emphasized. Open only to students in the School of Nursing. [2-2-0]
- 201 3 Introductory Microbiology – Fundamental properties of prokaryotes: structure, metabolic diversity, environmental relationships, growth, genetics and applications. Prerequisite: BIOL 120 [3-2*-0]
- 202 3 Introductory Medical Microbiology and Immunology – Introduction to cellular and humoral immune responses, the properties of viruses and the principles of bacterial pathogenesis. Prerequisite: MICB 201. [3-2*-0]
- 302 (3) Immunology – Tissues, cells and molecules of immune system, innate immunity and complement, adaptive immunity, cellular and humoral immune responses, cytokines, T-cell activation, the major histocompatibility complex, antibody structure and genetics, immune system and cancer, AIDS, autoimmunity, hypersensitivity. Prerequisite: MICB 202. [3-0-1]
- 307 (3) Food and Industrial Microbiology – The role of microorganisms in food preservation, food spoilage, sanitation indices and waste treatment. Prerequisite: MICB 201 [3-0-0]
- 309 (3) Food Microbiology – The role of microorganisms in industry, food preservation, food spoilage, sanitation indices and waste treatment. Restricted to students registered in Food Science. Credit will not be given for both MICB 307 and MICB 309. Prerequisite: MICB 201. [3-2-0]

- 318 (3) Biotechnology and Fermentation-Process Engineering – Technology of large-scale cultivation of micro-organisms, isolation and purification of products, industrial application. Emphasizes applications of recombinant DNA, cell fusion and use of novel host organisms such as mammalian cells. Prerequisite: MICB 201. [3-0-0]
- 321 (6) Microbiological Techniques – Procedures associated with growth, metabolism and genetics of microorganisms. Restricted to Majors and Honours students in Microbiology. Prerequisites: MICB 201 and MICB 202. Corequisites: BIOC 302 (or BIOC 300 or BIOC 303), BIOL 335, MICB 324. [0-4-2; 0-4-2]
- 322 3 Microbiological Techniques I – First half of MICB 321. Restricted to students in the Co-operative Education Program of Biotechnology in Microbiology and Immunology. [0-4-2]
- 323 3 Microbiological Techniques II – Second half of MICB 321. Prerequisite: MICB 322. [0-4-2]
- 324 (3) The Molecular Basis of Bacterial Growth Regulation – Response of bacterial cell to changing environments. Role of the cell envelope in energetics, transport and peptidoglycan synthesis. Regulation of gene expression. Biochemistry and physiology of bacterial growth. Prerequisite: MICB 201. Corequisite: BIOC 302 (BIOC 300 or BIOC 303). [3-0-1]
- 398** (0) Co-operative Work Placement I – Work experience in an industrial research setting. Normally taken during Summer Session (Term 1) following third year. Restricted to students admitted to the Co-operative Education Program of Biotechnology in Microbiology and Immunology. Prerequisite: MICB 202.
- 399** (0) Co-operative Work Placement II – Work experience in an industrial research setting. Normally taken during Summer Session (Term 1 and Term 2) following third year. Restricted to students admitted to the Co-operative Education Program of Biotechnology in Microbiology and Immunology. Prerequisite: MICB 398.
- 400 (3) Microbial Ecology – Effects of microbial and metabolic activities in nature. Interactions of microbes with microbes, plants and animals. Metabolic basis for applied uses of environmental bacteria. Prerequisites: MICB 201 and BIOL 201. (Same as SOIL 400.) [3-0-0]
- 401 (3) Microbial Ecology and Diversity Laboratory – Enrichment and selection techniques to isolate and examine heterotrophic, autotrophic, aerobic and anaerobic bacteria of soil and aquatic environments. Prerequisites: MICB 201 and BIOL 201. Corequisite: MICB 400. (Same as SOIL 401.) [0-6-0]
- 402 (3) Advanced Immunology – Current advances in immunology with emphasis on T and B cell development, generation of receptor diversity, immunogenetics, lymphocyte activation, and the major histocompatibility complex. Prerequisite: MICB 302. [3-0-1]
- 403 (3) Molecular Bacterial Pathogenesis – Molecular studies of bacterial pathogens. Topics include bacterial virulence factors, host defences against pathogens and vaccines, and diagnostics and antibiotics as control measures. Prerequisite: MICB 202. [3-0-0]
- 408 (3) Molecular Virology – Introduction to virus structure and replication. Detailed examination of selected viruses including polio, HIV and cancer-causing retroviruses. Development of vaccines and anti-viral drugs, the use of virus vectors to cure genetic diseases. Prerequisite: MICB 202. [3-0-0]
- 409 (3) Microbial Genetics – Plasmids, phage and cloning vectors, gene transfer, genetic maps, genetic analysis of microbial gene expression. Prerequisite: BIOL 335. [3-0-0]
- 410 (3) Microbial Metabolism – Bacterial metabolism of environmental relevance such as anaerobic metabolisms, xenobiotics degradation, co-metabolisms, secondary metabolisms, and transformation of minerals and halo-organisms. Applications and theoretical basis of particular capabilities. Prerequisites: MICB 201, CHEM 230 and BIOL 201. [3-0-0]
- 415 (3) Principles of Pathogenic Microbiology – Basic principles of microbial structure, growth and genetics. Defence mechanisms of the body, pathogenic properties of bacteria and viruses. Microbial diseases with oral manifestations. Antibiotics. Restricted to students in the Faculty of Dentistry. [3-0-0]
- 418 (3) Physiology and Genetic Manipulation of Industrial Micro-organisms – The physiological, genetic, developmental and morphological features of micro-organisms and animal cells which make them useful in industrial processes. Corequisite: BIOL 335. [3-0-0]
- 419 (3) Techniques in Microbial Technology – Modern fermentation technology and downstream processing of fermentation products. Prerequisite: MICB 318 and permission of the Head. [1-4-0]
- 421 (3) Advanced Microbiological Techniques – Techniques used in the identification and characterization of microorganisms of medical and commercial significance. Genetic manipulation of microorganisms. Prerequisite: MICB 321 or MICB 322. [0-4-2]
- 425 (3) Oral Microbiology – Discussion of the oral microbial flora; characteristics of oral organisms; ecological determinants; pathogenic properties of cariogenic and periodontopathic bacteria. Plaque formation, metabolism and control of bacteria. Restricted to students in the Faculty of Dentistry. [2-2-0]
- 430 (6) Seminar in Microbiological Literature – Student seminars on selected papers from the microbiological literature. Compulsory for Honours students. Major students may enrol with permission of the Head of the Department.
- 448 (3/6) c Directed Research – A library (3 credits) or laboratory (6 credits) project in the final year of the Major program. Requires permission of the Head of the Department. The results are presented in a written report to be reviewed by oral examination. Prerequisite: MICB 321 or MICB 323.
- 449 (6) Research Problem – A laboratory investigation in the final year of the Honours program. The results are presented in a written report, to be reviewed by oral examination. Prerequisite: MICB 321 or MICB 323.
- 498** (0) Co-operative Work Placement III – Work experience in an industrial research setting. Normally taken during the Summer Session (Term 1 and Term 2) following fourth year. Restricted to students admitted to the Co-operative Education Program of Biotechnology in Microbiology and Immunology. Prerequisite: MICB 399.
- 499** (0) Co-operative Work Placement IV – Work experience in an industrial research setting. Normally taken during the Winter Session (Term 1) following fifth year. Restricted to students admitted to the Co-operative Education Program of Biotechnology in Microbiology and Immunology. Prerequisite: MICB 498.
- 502 (3) Advanced Immunogenetics – Same as MEDG 510.
- 503 (3) Bacterial Cytology and Genetics
- 505 (3) Molecular Microbiology
- 506 (2-6) d Microbiological Research Procedures – Normally taken in conjunction with MICB 530. To be taken only with permission of the Head of the Department.
- 507 (3) Topics in Molecular Pathogenesis and Immunology
- 508 (3) Molecular Genetics of Plant-Microbe Interactions – Same as PLNT 508.
- 530 (3) Seminar in Microbiology
- 548 (6) Directed Studies on an Approved Problem
- 549 (12) Master's Thesis
- 649 Ph.D. Thesis

Mining and Mineral Process Engineering MMPE

FACULTY OF APPLIED SCIENCE

- 290 (4) Introduction to Mining and Mineral Processing – The nature and scope of mining and mineral processing. The course will include one afternoon field trip. [3-2-0; 0-0-0]
- 293 (1) Seminar – Oral presentation of topics by students. [0-0-1; 0-0-1]
- 295 (3) Computer Applications in Mining and Mineral Processing – Numerical methods for modelling stress/strain in mines; CAD, spreadsheet and simulation applications for planning and mine/milling operations; expert systems. Prerequisite: CPSC 152. [0-0-0; 2-1-1]
- 301 (4) Mine Services – Introduction to mine services and mine ventilation, drainage, air and water reticulation. Power supply. Noise and lighting. Safety, fire prevention and rescue. Mine maintenance. Prerequisite: MMPE 290. [0-0-0; 3-2-0]
- 302 (3) Mining Methods and Equipment – Selection, design and development of surface and underground mining methods based upon physical, geological, economical and environmental constraints; equipment selection; production requirements, performance and costs. Prerequisite: MMPE 290. [0-0-0; 3-3*-0]
- 303 (3) Rock Properties – The study of the mechanical properties of rock materials at the laboratory and field level. The relevance of such studies to common mining problems, geological and civil engineering problems. [0-0-0; 2-2-0]
- 304 (2) Rock Fragmentation – Theory and practice of rock fragmentation by drilling and blasting and by machine boring and cutting. Review of less common rock breaking methods. Introduction to explosive types and strengths. Detonators; delay methods of blasting. Charge sizing and choice of explosive; determination of burden. Smooth blasting and splitting methods. [2-0-0; 0-0-0]
- 331 (4) Unit Operations – Mineral processing unit operations and sampling, crushing, grinding, screening, classification, gravity separation, magnetic separation, electrostatic separation, concentrate dewatering practices. Prerequisite: MMPE 290. [3-3-0; 0-0-0]
- 333 (4) Flotation – Theory and technology of flotation processes, reagents used in dewatering practices. Prerequisite: MMPE 290. [0-0-0; 3-3-0]
- 393 (1) Seminar – Oral presentation of topics by students. Prerequisite: Third year standing in MMPE. [0-0-1; 0-0-1]
- 396 (3) Engineering Economics – Accounting principles, time value of money principles, depreciation and taxes, economic analysis of projects, sensitivity and risk analysis, financing and cost of capital; optimization of product processes. Prerequisite: Third-year standing in engineering. [3-0-0; 0-0-0] or [0-0-0; 3-0-0]
- 397 (3) Mineral Economics and Ore Reserve Estimation – Ore reserve estimation, graphical, statistical and geostatistical methods, mineral economics, supply/demand cut off grade, taxation, mineral price, feasibility project description. Mine modelling software and a case study on ore reserve estimations. Prerequisite: third-year standing in Mining and Mineral Process Engineering, Metals and Materials Engineering, or Geological Engineering. [0-0-0; 2-0-2]
- 401 (3) Mine Design – The design of a mine as part of a realistic feasibility project that includes plant design (MMPE 431) as a component. Mining, geological, mechanical and civil engineering principles are applied. Prerequisite: MMPE 396 or equivalent. [2-3-0]
- 402 (3) Mine Ventilation – Analysis and design of ventilation and air conditioning systems for mines and mills. Prerequisite: MMPE 290. [2-2*-0; 0-0-0]
- 403 (3) Rock Mechanics – The principles of rock behaviour as influenced by mining and excavation; influence of structural geology, groundwater and blasting on stability ground

- support systems and design, rock bursting underground, stability analysis, stabilization and monitoring to assess rock behaviour. [3-0-0; 0-0-0]
- 431 (3) Plant Design – Design of a mineral processing plant as part of a realistic feasibility study project that includes MMPE 401 as a component. Prerequisites: MMPE 331, MMPE 333, MMPE 396 or equivalent. [0-0-0; 2-0-3]
- 432 (3) Control of Mineral Processes – Application of automatic control to mineral processing. Review of control strategies actually employed for crushing, grinding and flotation circuits. Evaluation of final control elements and primary sensors currently in use. Prerequisite: Fourth year standing in MMPE. [2-3-0; 0-0-0]
- 433 (3) Surface Properties – Basic characteristics of interfaces. Electrical effects at solid/liquid interfaces. Surfactants, adsorption and its effect on wettability. Utilization of surface properties in mineral engineering: flotation, selective flocculation and selective coagulation, oil agglomeration. Prerequisite: CHEM 262. [2-3-0; 0-0-0]
- 434 (3) Processing Precious Metal Ores – Process alternatives and mineralogical considerations; physical and chemical recovery technologies; environmental protection; flowsheet studies. Prerequisites: MMPE 331. [2-1-0; 0-0-0]
- 461 (2) Coal Mining Technology – Coal mining practice, equipment selection and mining methods; techniques required to prevent hazards and explosions. Prerequisite: MMPE 290. [2-0-0]
- 462 (3) Coal Preparation Technology – Thermal and metallurgical coals: objectives of their cleaning; coal washability and flotability fundamentals; coal preparation unit operations; performance characteristics of coal washing equipment; products dewatering; plant flowsheets. Prerequisite: MMPE 290, 331. [2-3-0]
- 491 (2) Mining and The Environment – Environmental topics of importance to solid, liquid and gaseous waste disposal from mining and metallurgical operations. [0-0-0; 2-0-0]
- 492 (1) Field Trip – Field trip to various mining properties during the first week of September. Mark based on a field trip report. The Department partially subsidizes the costs. Prerequisite: Fourth year standing in MMPE.
- 493 (1) Seminar – Oral presentation of a technical nature. Use of closed circuit television for personal evaluation. Prerequisite: Fourth year standing in MMPE. [0-0-1; 0-0-1]
- 494 (6) Thesis/Report – Completion of thesis or engineering report based on work performed. Prerequisite: Fourth year standing in MMPE. [0-3-0; 0-6-0]
- 495 (3) Systems Analysis – Optimization and operations research techniques used in mining and mineral processing including effects of multiple factors in a process. Case studies are used to demonstrate the techniques. [3-0-1]
- 498 (3) Materials Handling – Basic theory and practice of bulk solids and slurry handling. Case studies. Design with equipment selection. Prerequisite: MMPE 231. [2-3-0; 0-0-0]
- 499 (3) Industrial Expert Systems – Use of artificial intelligence in industry; topics include knowledge acquisition and representation, conflict resolution, fuzzy logic, certainty factors, neural networks, genetic algorithms; students will design a prototype system as a major term assignment. [2-2-0]
- 550 (2) Mining Methods – A more advanced study of some aspects of mining methods.
- 551 (3) Applied Underground Rock Mechanics – Selected Topics.
- 552 (2) Geostatistics Applied to Mining – Application of geostatistical techniques to specific mining problems using data obtained from active mining operations.
- 553 (2-4) d Operations Research – Production engineering, linear programming, queuing theory and applications, simulation, reliability theory, game theory, dynamic programming.
- 554 (2) Mineral Property Evaluation – Identification of variables pertinent to the assessment of mineral properties, the interrelationship and interdependence of such variables; influence of present value criteria, mining taxation, and sources of available finance.
- 555 (2) Rock Mechanics in Practice – Case examples of investigation of rock and of design and construction in rock including geomechanical engineering problems, evaluation and stabilization.
- 556 (2) Rock Slope Engineering – Geologic investigations and field and laboratory testing; detailed review of the mechanisms of rock slope instability; the influence of geology, ground water and blasting on rock slope stability; design of stable rock slopes; monitoring of rock slope behaviour; stabilization or rock slope failures.
- 557 (2) Underground Stability in Rock – Rock classification, geological investigations and in situ and laboratory testing for underground development; stress conditions in rock for various excavation configurations and engineering purposes; excavation techniques; monitoring geomchanics behaviour and stabilization of underground rock failures.
- 558 (2) Tunnel Engineering – Stress conditions around tunnels at various depths and for various rock conditions; site and laboratory investigations; design of tunnels; support and construction techniques; 'cut and cover' methods of construction; tunnelling machines; tunnelling in bad ground; stabilization.
- 560 (2) Mine Ventilation – Mine air conditioning, ventilation network analysis, radioactivity in mining, case studies in mine ventilation and control of dust, fumes and diesel exhausts.
- 561 (2) Mine Shafts and Hoisting – Shaft layout, guide and hanton selection. Hoist rope properties and characteristics. Drum, reel and friction hoisting. Loading and dump arrangements. Headframe layout. Incline hoisting. Signalling and safety devices. Shaft inspection and maintenance. Sinking hoists and stages.
- 562 (2) Equipment Selection – Methods of selecting equipment for underground and surface mining. Case studies and applications.
- 564 (2-4) d Mineral Economics – Mineral markets, mining finance, governmental regulations, taxation, feasibility studies. Prerequisite: MMPE 396.
- 565 (2) Rock Fragmentation – Theory and practice of drilling and blasting; explosive types and strengths. Blast pattern design for underground and surface operations.
- 566 (3) Advanced Coal Preparation – Thermal and metallurgical coals. Desulphurization. Theory of coal beneficiation. Dense media separation. Coal surface properties and their effect on fine coal processing by flotation and oil agglomeration; coal/water/slurries. Plant performance testing and instrumentation.
- 572 (2/4) d Processing of Mineral Fines – Particulate systems. Role of particle size and interfacial phenomena in properties of disperse systems. Stability of colloids and suspensions. DLVO (Dejaguin-Landau-Vervey-Overbeek) theory. Beneficiation of mineral fines. Four credits instead of two will be given when the student satisfactorily completes and extra project.
- 573 (2) Treatment of Mineral Industry Effluents – Characteristics of mineral dispersions in gases and in water; dust suppression in mining and in mineral transport facilities; solid-liquid separations; removal of noxious chemicals; waste disposal systems. Prerequisite: Permission of instructor.
- 575 (3) Mathematical Modelling of Mineral Processes – Emphasis on crushing, grinding, screening, classification and flotation.
- 576 (3) Simulation and Optimization of Mineral Processes – Mineral process simulators including off-line optimization strategies; optimal flow sheet design. Prerequisite: MMPE 575.
- 577 (3) Processing of Precious Metal Ores – Advances in science and technology for recovering gold, silver and platinum group elements.
- 578 (3) Industrial Expert Systems – The use of artificial intelligence to solve complex problems in industry. Topics include knowledge acquisition, knowledge representation, knowledge accumulation, and conflict resolution.
- 580 (3) Acid Rock Drainage.
- 590 (2-6) c Special Advanced Topics – A special advanced course may be arranged upon the approval of the Head of the Department. Prerequisite: Permission of instructor.
- 592 (2/4) c Stability and Rheology of Mineral Suspensions – Fine particle systems in mineral processing. DLVO (Dejaguin-Landau-Vervey-Overbeek) theory. Heavy media rheology. Effect of pulp rheology on wet grinding. Coal/water slurries. Fine coal agglomeration during pipelining. Four credits instead of two will be given when the student satisfactorily completes and approved extra project.
- 596 (0) Engineering Report – An engineering report on a research or design topic under the supervision of a faculty member.
- 597 (0) Engineering Project – A project involving laboratory, pilot plant or field work is to be completed in close collaboration with an academic adviser. For M.Eng. students only.
- 598 (2) Seminar
- 599 Thesis – For M.A.Sc. degree. Research studies in mining or mineral process engineering.
- 698 (2) Seminar.
- 699 Thesis – For Ph.D. Degree.

Modern Language Education MLED
SEE LANGUAGE EDUCATION, FACULTY OF EDUCATION

Music MUSC
SCHOOL OF MUSIC, FACULTY OF ARTS

- 100 (2) Theory of Music I – Review of basic concepts and of rudiments of notation. The study of elementary diatonic harmony through work in bass realization and melody harmonization. Analysis of phrase structures and small forms. Drills in score reading. Restricted to B.Mus. and B.A. in Music students. [3-0; 0-0]
- 101 (2) Theory of Music II – Continued study of diatonic harmony, to include treatment of all diatonic triads and sevenths, principles of voice-leading, and techniques of contrapuntal expansion. Analysis of short movements in binary and ternary form. Drills in score reading. Prerequisite: MUSC 100. [0-0; 3-0]
- 102 (2) Class Strings – Group instruction in music performance. (Restricted to B.Mus. students.) [2-0; 2-0]
- 103 (3) Introduction to the Theory of Music – Concepts of rhythm, pitch, timbre, and texture. Notation and aural recognition of rhythmic and pitch patterns. Basic principles of melody and form. This course is not applicable to the B.Mus. degree. [3-0; 0-0]
- 104 (3) Introduction to Diatonic Harmony – Triads, keys, and elementary harmony in Western music. Musicianship (sightsinging, dictation, and keyboard). Elements of form and orchestration. Students choose between a two-hour laboratory in musicianship and a one-hour laboratory in composition in historical styles. Students aiming at elementary teaching certification should take the musicianship laboratory. This course is not applicable to the B.Mus. degree. Prerequisite: MUSC 103 or permission of the instructor. [0-0; 3-1] or [0-0; 3-2]
- 105 (2) Aural Skills I – Development of aural perception in reinforcement of MUSC 100 and 101, which are taken concurrently with this course. Out-of-context recognition of intervals and chords. Melodic, two-part, and harmonic dictation. Sight singing. Aural analysis of form and struc-

- ture. Restricted to B.Mus. and B.A. in Music students. [0-2; 0-2]
- 107 (3/6) d Composition I – An introduction to musical composition. Prerequisite: permission of the Composition Division based on submission of scores. [2-0; 2-0]
- 112 (2) Class Brasses and Percussion – Group instruction in music performance. (Restricted to B.Mus. students.) [3-0; 3-0]
- 120 (3) Music in Society – An introductory survey of music and musical values in Western and selected non-Western societies through humanistic, cultural, historical, and musical-analytical perspectives. [3-0; 0-0]
- 121 (3) History of Music I – The development of European music from Greek antiquity to circa 1600. [0-0; 3-0]
- 122 (2) Class Woodwinds – Group instruction in music performance. (Restricted to B.Mus. students.) [2-0; 2-0]
- 131 (2) Class Voice – Group instruction in music performance. Required of all first-time secondary voice students. (Restricted to B.Mus. students.) [2-3; 2-3]
- 135 (2) Opera Repertoire I – A musico-dramatic study and analysis of representative works in the international operatic theatre from 1600 to the present, through musical, literary and graphic sources. Each sequential year of study, the student is expected to show increased facility in musical and dramatic analysis as well as a greater understanding of the works under examination. Open to students outside the B.Mus. program by permission of the instructor. [2-0; 2-0]
- 136 (2/4) d Piano Repertoire I – Performance and discussion of the repertoire for string-keyboard instruments essential to the performer and teacher. Special attention to matters of structure, style, and performance practices. Required of piano performance majors and open to piano concentrators, space permitting. First term prerequisite to second term. [3-0] or [3-0; 3-0]
- 141 (2) Class Piano I – Required of all first-time secondary piano students. [2-3; 2-3]
- 149 (2) Keyboard Harmony and Transposition – Designed for the keyboard performance major and keyboard concentrator in General Studies. [0-1; 0-1]
- 150 (4) Large Instrumental Ensemble – Symphony Orchestra or Wind Ensemble. May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 151 (2) University Chamber Orchestra – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 153 (4) University Singers – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-5; 0-5]
- 154 (3) University Choral Group – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-1.5; 0-4.5]
- 155 (4) University Chamber Singers – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4.5; 0-4.5]
- 156 (2) Instrumental Collegium Musicum Ensemble – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 157 (2) Vocal Collegium Musicum Ensemble – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 159 (2) University Chamber Strings – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-2; 0-2]
- 160 (2) String Chamber Ensembles – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 161 (2) Piano Chamber Ensembles – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 162 (2) Wind and Percussion Chamber Ensembles – May be repeated for credit in accordance with program requirements for B.Mus. or B.A. in Music. Open to other students by audition, with credit, as stipulated by their faculties. [0-4; 0-4]
- 163 (2) Contemporary Players – Performance of contemporary music. An ensemble of variable size, including both instrumentalists and singers, will be formed to present several concerts of 20th-century music during the academic year. [0-4; 0-4]
- 164 (2) Stage Band – Performance techniques and repertoire of the jazz ensemble. [0-4; 0-4]
- 165 (2) Asian Music Ensemble – Study of Asian music, with training in instrumental techniques and ensemble performance. The music of one major Asian civilization, often Chinese, will be emphasized. Students should consult the instructor for particulars. [0-2; 0-2]
- 166 (1) Intensive Chamber Ensemble – Intensive coaching in chamber ensemble for advanced players. Performance of works prepared is expected. Prerequisite: permission of instructor. Corequisite: any small ensemble - MUSC 160, 161, or 162. [0-3]
- 169 (1) Intensive Specialized Chamber Ensemble – Intensive coaching in specialized chamber ensemble for advanced players. Performance of works prepared is expected. Prerequisite: permission of instructor. Corequisite: any specialized ensemble - MUSC 151, 156, 157, 159, 163, 164 or 165. [0-3]
- 170 (2) Lyric Diction – A study of the basic phonetics and accepted principles of lyric diction of the four languages most commonly used in concert and operatic repertoire: French, German, Italian, and English. [2-0; 2-0]
- 171 (2) Music Performance (Secondary) – Private instruction, vocal or instrumental. This course also lists as MUSC 271, 371 and 471. [0-5; 0-5]
- 172 (4) Music Performance (Secondary) – Private instruction, vocal or instrumental. This course also lists as MUSC 272, 372 and 472. [0-1; 0-1]
- 173 (6) Music Performance (Secondary) – Private instruction, vocal or instrumental. This course also lists as MUSC 273, 373 and 473. [0-1.5; 0-1.5]
- 181 (2) Music Performance (Concentration) – Private instruction, vocal or instrumental. This course also lists as MUSC 281, 381 and 481. [0-5; 0-5]
- 182 (4) Music Performance (Concentration) – Private instruction, vocal or instrumental. This course also lists as MUSC 282, 382 and 482. [0-1; 0-1]
- 183 (6) Music Performance (Concentration) – Private instruction, vocal or instrumental. This course also lists as MUSC 283, 383 and 483. [0-1.5; 0-1.5]
- 184 (8) Music Performance (Concentration) – Private instruction, vocal or instrumental. This course also lists as MUSC 284, 384 and 484. [0-1.5; 0-1.5]
- 191 (2) Music Performance (Major) – Private instruction, vocal or instrumental. This course also lists as MUSC 291, 391 and 491. [0-5; 0-5]
- 192 (4) Music Performance (Major) – Private instruction, vocal or instrumental. This course also lists as MUSC 292, 392 and 492. [0-1; 0-1]
- 193 (6) Music Performance (Major) – Private instruction, vocal or instrumental. This course also lists as MUSC 293, 393 and 493. [0-1.5; 0-1.5]
- 194 (8) Music Performance (Major) – Private instruction, vocal or instrumental. This course also lists as MUSC 294, 394 and 494. [0-1.5; 0-1.5]
- 195 (10) Music Performance (Major) – Private instruction, vocal or instrumental. This course also lists as MUSC 295, 395 and 495. [0-1.5; 0-1.5]
- 200 (2) Theory of Music III – Chromatic and contrapuntal expansions of diatonic harmony, to include tonicization and modulation, conventional chromatic chords, sequential progression, and advanced voice-leading techniques. Analysis of sonata forms. Drills in score reading. Prerequisite: MUSC 101. [3-0; 0-0]
- 201 (2) Theory of Music IV – Continued study of chromatic tonal harmony, including further consideration of standard chords and devices. Study of works or section of works, e.g., development sections, of fluctuating tonal contents. Continued analysis of sonata form with consideration of other large forms. Drills in score reading. Prerequisite: MUSC 200. [0-0; 3-0]
- 203 (3) Melody, Counterpoint, and Harmony – Formal, technical, and stylistic principles. Students choose between a two-hour laboratory in musicianship (sightsinging, dictation, and keyboard) and a one-hour laboratory in composition in historical styles. This course is not applicable to the B.Mus. degree. Prerequisite: MUSC 104 or permission of the instructor. [3-1] or [3-2; 0-0]
- 204 (3) Introduction to Chromatic Harmony and 20th-Century Techniques – Formal, technical, and stylistic principles of chromatic tonal music and selected music of the 20th century. Students choose between a two-hour laboratory in musicianship (sightsinging, dictation, and keyboard) and a one-hour laboratory in composition in historical styles. This course is not applicable to the B.Mus. degree. Prerequisite: MUSC 203 or permission of the instructor. [0-0; 3-1] or [0-0; 3-2]
- 205 (2) Aural Skills II – Development of aural perception in reinforcement of MUSC 200 and 201, which are normally taken concurrently with this course. A continuation of MUSC 105. Prerequisite: MUSC 105. [0-2; 0-2]
- 207 (3/6) c Composition II – Continuation of MUSC 107. Prerequisite: Completion of MUSC 107 and permission of Composition Division based on submission of scores. First term prerequisite to second. [0-1] or [0-1; 0-1]
- 220 (3) History of Music II – The development of European music from circa 1600 to circa 1800. Prerequisite: MUSC 121. [2-1; 0-0]
- 221 (3) History of Music III – The development of European music, and its offshoots in the Americas, from circa 1800 to the present. Prerequisite: MUSC 220. [0-0; 2-1]
- 225 (3) Masterworks of Western Music – A survey in one of the major genres of Western music. Not for credit toward the B.Mus. or B.A. degree in Music. [3-0]
- 233 (2) Accompanying on the Harpsichord I – Basic techniques and styles of continuo playing. Open to keyboard players with no previous harpsichord experience. Prerequisite: MUSC 149 or permission of instructor. [0-2; 0-2]
- 235 (2) Opera Repertoire II – See MUSC 155.
- 236 (2/4) d Piano Repertoire II – Continuation of MUSC 136. [3-0] or [3-0; 3-0]
- 241 (2) Class Piano II – Continuation of MUSC 141. [2-3; 2-3]
- 249 (2) Keyboard Accompanying I – Accompanying on the piano or organ. [0-1; 0-1]
- 300 (3) Theory of Music V – Techniques and theoretical concepts underlying major compositional developments from about 1890 to 1950. Exercises in analysis and composition. Continued training in related aural skills. Prerequisite: MUSC 201. [3-0; 0-0]

- 301 (3) Theory of Music VI – Techniques and theoretical concepts underlying major compositional developments from 1950 to the present. Exercises in analysis and composition. Continued training in related aural skills. Prerequisite: MUSC 300. [0-0; 3-0]
- 305 (2) Readings in Orchestral Repertoire – A laboratory course designed primarily for orchestral wind and percussion performance majors. Emphasis on reading a large cross-section of standard orchestral repertoire with further emphasis given to music currently being programmed by local professional orchestras. [0-1; 0-1]
- 307 (3/6) c Composition III – Continuation of MUSC 207. Prerequisite: Completion of MUSC 207 and permission of Composition Division based on submission of scores. [0-1] or [0-1; 0-1]
- 309 (2) Instrumentation – The study of string, woodwind, brass and percussion instruments; orchestral sections and scoring for various small ensembles. Activities include demonstrations of instruments, scoring projects, analysis and listening. For credit towards the B.Mus. and the B.A. in Music; not open to other students. Prerequisites: MUSC 201 and completion of the second-year piano requirement. [2-0; 0-0]
- 310 (2) Orchestration – The study of orchestration through the analysis of orchestral works, listening and scoring projects. Activities also include choral arranging and scoring for stage band and wind ensemble. Prerequisite: MUSC 309. [0-0; 2-0]
- 311 (4) Choral Conducting – Choral conducting techniques and practices. For credit towards the B.Mus. and the B.A. in Music; not open to other students. Only one of the courses MUSC 311 and MUSC 312 may be applied for credit towards the B.Mus. and the B.A. in Music. Prerequisites: MUSC 201 and completion of the second-year piano requirement. [2-0; 2-0]
- 312 (4) Instrumental Conducting – Instrumental conducting techniques and practices. For credit towards the B.Mus. and the B.A. in Music; not open to other students. Only one of the courses MUSC 311 and MUSC 312 may be applied for credit towards the B.Mus. and the B.A. in Music. Prerequisites: MUSC 201 and completion of the second-year piano requirement. [2-0; 2-0]
- 319 (3/6) d Introduction to Electroacoustic Music – Study of acoustics, audio technology, and electroacoustic composition. Composition of original works using facilities of the UBC Electroacoustic Music Studio. Prerequisites: MUSC 201 and permission of instructor. [3-0] or [3-0; 3-0]
- 320 (3) Computer Music – The study of computer applications to music, focussing on digital synthesis techniques and languages, methods of algorithmic composition, and the design of music editors. Prerequisite: MUSC 319 or permission of instructor. [3-0]
- 321 (3/6) d Music Appreciation, Twentieth-Century – Designed for students with little or no musical background. Not for credit toward the B.Mus. or B.A. degree in Music. [3-0] or [3-0; 3-0]
- 324 (3) Music and Civilization I – Development of music in relation to the other arts, science, philosophy, literature and history: Ancient Greece, the Middle Ages, and the Renaissance. Not for credit toward the B.Mus. or B.A. degree in Music. [3-0; 0-0]
- 325 (3) Music and Civilization II – A continuation of MUSC 324, dealing with Europe after 1600. Not for credit toward the B.Mus. or B.A. degree in Music. [0-0; 3-0]
- 326 (3/6) d Music Appreciation – An introductory course for which previous musical background is helpful, but not required. Contents include a discussion of musical concepts, evolution of forms, style, and media and detailed study of selected works from the concert repertoire. Popular forms of music (jazz, folk, rock, etc.) not included. Not for credit towards the B.Mus. or B.A. in Music degrees. [3-0] or [3-0; 3-0]
- 328 (3) World Music Cultures – Introduction to the principles of ethnomusicology and an examination of two contrasting musical traditions (e.g., North American Indian and Japanese). For credit toward the B.Mus. and the B.A. in Music but open to students not majoring in music with third-year standing. Non-music students should have some knowledge of music rudiments. [3-0; 0-0]
- 330 (3) Music in Vancouver's Ethnic Communities – Examination of music within the ethnic context as found in the urban environment of Vancouver. The musics of several traditions (e.g., Chinese, Jewish, English folk) will be studied together with the social issues surrounding their preservation. For credit toward the B.Mus. and the B.A. in Music but open to students not majoring in music. [3-0]
- 331 (2) Workshop in World Rhythm – Theory and practice of selected rhythmic systems of world music cultures, focusing on West African drumming, and including other systems such as Indian Tala and Peking opera percussion. Prerequisite: MUSC 201. [0-0; 0-3]
- 333 (2) Accompanying on the Harpsichord II – Continuation of MUSC 233 with emphasis on more advanced continuo and obbligato techniques. Prerequisite: MUSC 233. [0-2; 0-2]
- 335 (2) Opera Repertoire III – See MUSC 135.
- 336 (2/4) d Opera Theatre Techniques – Designed to meet the needs of singers in opera and lyric theatre. Stage techniques associated with the musical theatre of various historical periods, and as conditioned by structural elements of music. [2-1] or [2-1; 2-1]
- 339 (3/6) d Opera Workshop I – Participation in performances by the School. Open also to students outside Music without credit, after audition. [2-3; 2-3]
- 345 (3) Aesthetics and Practice of Film Music [3-0]
- 349 (2) Keyboard Accompanying II – Continuation of MUSC 249. [0-1; 0-1]
- 350 (3/6) d Early Christian and Medieval Music – Early notations and musical developments from early Christian times to 1400. Prerequisite: MUSC 121. [3-0] or [3-0; 3-0]
- 352 (3) Late Medieval and Early Renaissance Music – Sacred and secular music, vocal and instrumental. Prerequisite: MUSC 121. [3-0]
- 353 (3) Renaissance Music from 1500 to 1620 – Sacred and secular music, vocal and instrumental. Prerequisite: MUSC 121. [3-0]
- 354 (3) Baroque Music Prerequisite: MUSC 220. [3-0]
- 355 (3) Classical Music Prerequisite: MUSC 220. [3-0]
- 356 (3) Romantic Music Prerequisite: MUSC 221. [3-0]
- 357 (3) Twentieth-Century Music Prerequisite: MUSC 221. [3-0]
- 363 (4) History and Repertoire of the Guitar and Related Instruments – A chronological survey, from the Renaissance to the present day, of music for the guitar and related instruments and of the development of the instruments themselves. Instruments considered include Renaissance and Baroque lutes, the vihuela, and early types of guitar as well as the modern six-string guitar. Musical forms and genres, national schools and the works of principal composers of every period are explored and attention is given to national systems, continuo realization, historical ornamentation and pedagogical systems. Prerequisite: MUSC 221. [3-0; 3-0]
- 365 (2) Song Repertoire I – An exploration of the solo art song repertoire from 1600 to the Romantic period. Repertoire essential to the performer and teacher will be studied through live and recorded performance with special attention given to poetic content and musical style. Prerequisite: MUSC 221. [2-0; 2-0]
- 402 (3/6) c Special Projects – For fourth-year students who receive permission of the Director of the School of Music to do advanced studies in their major field. [0-3] or [0-3; 0-3]
- 403 (3/6) d Selected Topics in Music – See School of Music schedule for description and prerequisites. Restricted to B. Mus. and B.A. in Music students.
- 406 (2/4) d Conducting II – Advanced choral and orchestral conducting techniques and rehearsal practices. Prerequisite: MUSC 311 or MUSC 312, and permission of the instructor. [2-0] or [2-0; 2-0]
- 407 (3/6) c Composition IV – Continuation of MUSC 307, first term prerequisite to second. [0-1] or [0-1; 0-1]
- 409 (3/6) d Jazz Theory and Arranging – Jazz scales, chord relationships, substitutions, orchestration, listening, and score analysis. Restricted to B.Mus. and B.A. in Music students. Prerequisite: MUSC 201. [3-0] or [3-0; 3-0]
- 410 (3/6) d Special Topics in the Analysis of Tonal Music – Significant 20th-century concepts and methods of analysis of 18th- and 19th-century music, explored through selected readings and practical exercises. Prerequisite: MUSC 301 or permission of instructor. May be repeated for credit. [3-0]
- 411 (3) Homophonic Forms – Study of harmonic and formal models from the late 18th and 19th centuries, with exercises in composition. Prerequisite: MUSC 201 or permission of instructor. [3-0]
- 412 (3) Late Romantic Harmony – Study of harmonic concepts and devices of highly chromatic music, with exercises in composition. Prerequisite: MUSC 300 or permission of instructor. [3-0]
- 413 (3) Studies in Music, 1900-1945 – Analytical techniques and theories of pitch and rhythm appropriate to various styles emergent in the first half of the 20th century. Prerequisite: MUSC 301 or permission of instructor. [3-0]
- 414 (3) Renaissance Counterpoint – Study of 16th-century contrapuntal procedures and techniques, and melodic structure. Composition of representative forms. Prerequisite: MUSC 201 or permission of instructor. [3-0]
- 415 (3) Baroque Counterpoint – Study of late 17th- and early 18th-century contrapuntal procedures and techniques, and melodic structure. Composition of representative forms. Prerequisite: MUSC 201 or permission of instructor. [3-0]
- 417 (3/6) d Musical Scoring for Film – Addresses the practical aspects of composing music for film through assignments of written scores. Prerequisites: MUSC 319, and permission of the instructor. [3-0; 3-0]
- 427 (3/6) d Liturgical Music II – Music of the Western liturgies from the Reformation to the present day, including a study of hymnology. Prerequisite: MUSC 221. [3-0] or [3-0; 3-0]
- 428 (3/6) d Area Studies in Ethnic Musics – The history, theory, style, organology, and forms of the music of a particular culture in its aesthetic and cultural context, e.g., music of China, or Japan, or Korea, or Indonesia, or Middle East. Students should consult the School as to which music culture will be covered in a particular year. Prerequisite: MUSC 328. [3-0] or [3-0; 3-0]
- 430 (3/6) d Major Composers – The musical works of no more than two significant composers will be examined. Specific topics will be announced; may be repeated for credit. Prerequisite: MUSC 221. [3-0] or [3-0; 3-0]
- 435 (2) Opera Repertoire IV – See MUSC 135.
- 439 (3/6) d Opera Workshop II – A continuation of MUSC 339. [2-3] or [2-3; 2-3]
- 440 (2) Piano Teaching Methods and Materials [0-0; 2-0]
- 441 (2) Vocal Techniques – A study of the scientific principles related to vocal performance: acoustical, physiological and psychological. Restricted to B.Mus. students. [2-0; 1-1]
- 442 (2/4) d Song Interpretation and Accompaniment – Survey of the literature for voice with keyboard accompaniment, with emphasis on performance problems. Open to piano and voice majors, and to others by permission of instructor. Restricted to B.Mus. students. [0-2; 0-2]
- 449 (6) Graduating Essay

- 450 (3/6) d Selected Topics in Vocal or Instrumental Genres – Intensive study of one genre of music (e.g., orchestral music 1760-1849; the Lied in Austria and Germany) through analysis and the consideration of cultural milieu and historical development. Specific topics will be announced. May be repeated for credit to a maximum of six credits. [3-0] or [3-0; 3-0]
- 452 (3) History of Keyboard Music I – The development of keyboard music from 1300 to 1800. Prerequisite: MUSC 220. [3-0]
- 454 (3) History of Opera I – The development of opera between 1600 and 1800. Prerequisite: MUSC 220. [3-0]
- 455 (3) History of Opera II – The development of opera between 1800 and the present. Prerequisite: MUSC 221. [3-0]
- 465 (2) Song Repertoire II – A sequel to MUSC 365, exploring the solo art song repertoire from the Romantic era to the present. Prerequisite: MUSC 221. [2-0; 2-0]
- 500 (3/6) d Seminar in Analytical Techniques Prerequisite: at least one of MUSC 410-413.
- 501 (3) Tonal Analysis in the Twentieth Century I – Exercises and selected readings in Schenkerian analysis. Prerequisite: at least one of MUSC 410-412 or permission of instructor.
- 502 (3) Tonal Analysis in the Twentieth Century II – Studies in a variety of modern approaches to the analysis of tonal music. Prerequisite: at least one of MUSC 410-412 or permission of the instructor.
- 503 (3/6) d Topics in the History of Music Theory – Practical and speculative topics in the development of music theory within the Western tradition. Theoretical works considered in their relations to one another, to musical practice, and to the history of ideas. Students should consult the School as to the areas of focus in any given term.
- 504 (3/6) d Theoretical Studies in Twentieth-Century Music – Studies in the theoretical literature pertaining to twentieth-century music, and analysis of representative scores.
- 505 (3/6) d Instructional Goals and Methods in Basic Music Theory – Critical evaluation of goals and methods of training in music theory, and review of pertinent selected materials. Individual projects and practical exercises. Prerequisite: at least one of MUSC 410-412 or permission of the instructor.
- 506 (2) Readings in Orchestral Repertoire – Standard repertoire for wind and percussion players. See Divisional Coordinator for placement.
- 507 (3/6) c Composition – The composition of original music for conventional instruments and/or electronic media.
- 508 (3/6) c Composition – A continuation of MUSC 507. Prerequisite: MUSC 507 or equivalent.
- 509 (3/6) c Advanced Orchestration and Arranging
- 512 (3/6) c Directed Individual Studies – Approval by the Director, School of Music, is required.
- 520 (3/6) d Music Bibliography and Research Techniques – Introduction to the principal resources of the research library, with particular attention to reference tools and bibliographical repertoires.
- 521 (3/6) d Seminar in Performance Practices – Studies in the theoretical and practical problems of musical interpretation.
- 522 (3/6) d Seminar in Notation of Polyphonic Music
- 523 (3/6) d Seminar in Medieval Music
- 524 (3/6) d Seminar in Renaissance Music
- 525 (3/6) d Seminar in Baroque Music
- 526 (3/6) d Seminar in Classical Period Music
- 527 (3/6) d Seminar in Nineteenth-Century Music
- 528 (3/6) d Seminar in Twentieth-Century Music
- 529 (3) Introduction to Ethnomusicology – Preliminary studies in the discipline of ethnomusicology, with an emphasis on history and orientations.
- 530 (3) Topics in Ethnomusicology – Topics involving methodology and fieldwork in non-Western traditions. Topics will vary and students should consult the School as to areas of focus in any given term.
- 531 (3/6) d Seminar in Ethnomusicology – Research studies in selected areas or regions of world music cultures. Prerequisite: MUSC 529.
- 532 (3/6) d Advanced Studies in Music History and Musicology
- 537 (3/6) d Seminar in the Literature of Opera – Special topics related to the bibliography, history, repertoire and pedagogy of operatic music. Prerequisites: 221, 301, 454, 455; MUSC 520 (may be taken concurrently).
- 538 (3/6) d Staging and Directing Opera Prerequisite: Permission of instructor.
- 539 (6) Opera Production – Stylistic and technical studies and participation in the production of opera performances. Prerequisite: MUSC 439.
- 547 (3/6) d Seminar in the Literature of Song – Special topics related to the bibliography, history, repertoire and pedagogy of song. Prerequisites: 221, 301, 365, 465; MUSC 520 (may be taken concurrently).
- 549 (6/12) c Master's Thesis
- 550 (4) Large Instrumental Ensemble – Symphony Orchestra or Wind Ensemble. Open only to graduate students.
- 551 (2) University Chamber Orchestra – Open only to graduate students.
- 553 (4) University Singers – Open only to graduate students.
- 554 (3) University Choral Union – Open only to graduate students.
- 555 (4) University Chamber Singers – Open only to graduate students.
- 556 (2) Instrumental Collegium Musicum Ensemble – Open only to graduate students.
- 557 (2) Vocal Collegium Musicum Ensemble – Open only to graduate students.
- 559 (2) University Chamber Strings – Open only to graduate students.
- 560 (2) String Chamber Ensembles – Open only to graduate students.
- 561 (2) Piano Chamber Ensembles – Open only to graduate students.
- 562 (2) Wind and Percussion Chamber Ensembles – Open only to graduate students.
- 563 (2) Contemporary Players – Open only to graduate students.
- 564 (2) Stage Band – Open only to graduate students.
- 565 (2) Asian Music Ensemble – Study of Asian music, to include practical training in instrumental techniques and ensemble performance. The music of one major Asian civilization, often Chinese, will be emphasized.
- 566 (1) Intensive Chamber Ensemble – Intensive coaching.
- 569 (1) Intensive Specialized Chamber Ensemble – Intensive coaching.
- 571 (2) Music Performance (Secondary) – Private instruction, vocal or instrumental. Also lists as MUSC 671.
- 572 (4) Music Performance (Secondary) – Private instruction, vocal or instrumental. Also lists as MUSC 672.
- 573 (6) Music Performance (Secondary) – Private instruction, vocal or instrumental. Also lists as MUSC 673.
- 591 (2) Music Performance (Major) – Private instruction, vocal or instrumental. Also lists as MUSC 691.
- 592 (4) Music Performance (Major) – Private instruction, vocal or instrumental. Also lists as MUSC 692.
- 593 (6) Music Performance (Major) – Private instruction, vocal or instrumental. Also lists as MUSC 693.
- 594 (8) Music Performance (Major) – Private instruction, vocal or instrumental. Also lists as MUSC 694.
- 595 (10) Music Performance (Major) – Private instruction, vocal or instrumental. Also lists as MUSC 695.
- 606 (2) Readings in Orchestral Repertoire – Continuation of MUSC 506. See Divisional Coordinator for placement.
- 607 (3/6) c Composition – Further study for doctoral candidates in Composition.
- 609 (3/6) c Advanced Orchestration and Arranging Prerequisite: MUSC 509.
- 649 Ph.D. or D.M.A. Thesis

Music Education **MUED**
DEPARTMENT OF CURRICULUM STUDIES,
FACULTY OF EDUCATION

Natural Resources Conservation **CONS**

SEE FORESTRY

Naval Architecture
DEPARTMENT OF MECHANICAL ENGINEERING,
FACULTY OF APPLIED SCIENCE

Neuroscience **NRSC**
FACULTY OF GRADUATE STUDIES

500 (6) Neuroscience I – Comprehensive multidisciplinary course with lectures, seminars, and laboratory demonstrations encompassing molecular, cellular, systemic, and behavioural approaches to the study of nervous systems. Emphasis is on the physiology, pharmacology, and biochemistry of excitable cells and their synaptic interactions. Permission of Neuroscience Chair is required. (Normally to be taken in conjunction with NRSC 501.)

501 (6) Neuroscience II – Continuation of NRSC 500 with emphasis on the integrative functions of the brain, behaviour, and selected neural disorders. Permission of Neuroscience Chairman is required. (Normally to be taken in conjunction with NRSC 500.)

549 (12) Master's Thesis

649 Ph.D. Thesis

Neurosurgery
SEE SURGERY, FACULTY OF MEDICINE

Nursing **NURS**
SCHOOL OF NURSING, FACULTY OF APPLIED
SCIENCE

In the clinical nursing courses the ration between class and supervised nursing experience varies but in the overall program it is approximately 1:3, the credit values for these courses are based on both instruction and supervised nursing experience.

105 (2) Professional Nursing in Contemporary Society I – Beginning study of the nursing profession and characteristics of professional practice. [2-1-0; 0-0-0]

130 (3) Introduction to Nursing Care I – Beginning study of professional nursing practice, using the UBC Model for Nursing (Individual). [2-0-3; 0-0-0]

131 (4) Introduction to Nursing Care II – Study and application of selected concepts, skills and processes basic to the practice of nursing. Prerequisite: NURS 130. [0-0-0; 2-0-6]

202 (4) Core Concepts in Nursing – Study of core concepts pertaining to the care of individuals experiencing critical periods in the life cycle. [3-2-0; 0-0-0]

230 (6) Nursing Care of Adults – Theory and practice related to the nursing care of young and middle-aged adults in acute care, ambulatory care and community settings. Prerequisite or corequisite: NURS 202. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]

231 (6) Nursing Care of Older Adults – Theory and practice related to the nursing care of older adults in acute care, ambulatory care and community settings. Prerequisite or corequisite: NURS 202. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]

- 302 (6) The Process of Nursing I – Introduction to the UBC Model and related concepts, skills and processes basic to the practice of professional nursing. Students build upon previously acquired knowledge and skills with selected clients. Note: Registered nurse students only. [2-2-9; 0-0-0]
- 303 (4) Family and Community Nursing – Study of theories, concepts and processes basic to the nursing care of families, with application in seminar settings and clinical practice. Prerequisite: NURS 302. Corequisites: NURS 333, 334 or 335.
- 304 (3) Introduction to Nursing Research – Study of the research process and application of research findings to nursing practice. It is strongly recommended that STAT 203 be taken prior to or concurrently with NURS 304. [3-0-0; 3-0-0]
- 305 (2) Professional Nursing in Contemporary Society II – Study of the professional practice of nursing. Analysis of societal and health care contexts within which nursing has evolved and is practised. [1-2-0; 0-0-0]
- 333 (6) Nursing Care of Children – Study and application of concepts, skills and processes basic to the nursing care of children experiencing critical periods. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 334 (6) Nursing Care of Individuals in the Child-bearing Cycle – Study and application of concepts, skills and processes basic to the nursing care of individuals during the child-bearing cycle. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 335 (6) The Process of Nursing II – Study and application of theory and concepts related to the nursing care of clients experiencing critical periods in a variety of settings. Students will contract to meet own learning needs and develop communication and teaching abilities. Note: Registered Nurse students only. Prerequisite: NURS 302. Corequisite: NURS 303 [0-0-0; 3-0-12]
- 340 (0) Work Study Experience – Supervised clinical experience in a health care agency. This is an optional experience restricted to students meeting the requirements of the School of Nursing and the individual agency. Students are required to pay a fee and enrolment is subject to the availability of appropriate placements.
- 405 (2) Issues in Professional Nursing – Study of the nursing profession and its role in Canadian society. Analysis of issues related to the development of the profession. Prerequisite: NURS 105 and/or 305. [0-0-0; 1-2-0]
- 406 (3) Management in Nursing Practice – Study of theories, principles and skills related to planned change, management and leadership as they affect the provision of nursing care. [3-0-0; 0-0-0]
- 408 (3/6) c Guided Study in Nursing – A course of study which enables the student to contract for pursuit of an area of particular interest in nursing. To be designed in consultation with a faculty member with expertise in the chosen area. Prerequisite: completion of third year nursing courses.
- 409 (3/6) c Clinical Nursing Elective – An opportunity to increase knowledge and skills in an identified area of clinical interest in nursing. Students work under the guidance of faculty with expertise in the area. Prerequisite: Completion of third year nursing courses.
- 426 (3) Nursing and the Health of Communities – Study of epidemiological concepts as they relate to the health of Canadian communities. Application of concepts to the planning of health care programs. Prerequisite: Third- or fourth-year standing in Nursing. Open to other health science students with permission of instructor. [3-0-0; 0-0-0]
- 432 (6) Nursing of Adults and Families with Mental Health Concerns I – Study and application of theories, concepts, skills and processes in the care of individuals and families with mental health concerns. Clinical practice in acute care, ambulatory care and community settings. Note: Generic students only. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 440 (6) Nursing Care of Adults and Families Experiencing Acute and Long-Term Disabilities – Advanced nursing practice with individuals and families experiencing acute and long-term disabilities. Application of theories and concepts in acute, ambulatory, long-term care and community settings. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 441 (6) Nursing Care of Older Adults and their Families – Advanced nursing practice with older adults and their families. Application of theories and concepts in acute, intermediate, long-term care and community settings. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 442 (6) Nursing Care of Adults and Families with Mental Health Concerns II – Advanced nursing practice with clients with mental health concerns. Application of theories and concepts in a variety of settings. Prerequisite: Generic students only, NURS 432. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 443 (6) Nursing Care of Children and their Families – Further study and application of concepts, skills and processes basic to the nursing care of children and families experiencing critical periods. [2-0-12; 0-0-0] or [0-0-0; 2-0-12] [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 444 (6) Nursing Care of Child-bearing Families – Further study and application of concepts, skills and processes basic to the care of child-bearing families, with an emphasis on unpredictable events. [2-0-12; 0-0-0] or [0-0-0; 2-0-12]
- 445 (0) Extended Practicum in Professional Nursing – A three-week (120 hours) practicum in nursing to be completed in April/May prior to graduation. This practicum is designed to assist students to consolidate knowledge and skills acquired in previous theory and clinical courses and to facilitate socialization into the role of the baccalaureate prepared nurse.
- 510 (3) Theory Development in Nursing – History, selected models and implications for the profession.
- 522 (4) Nursing Research – The research process and its relationship to theory development in nursing. Prerequisite or corequisite: NURS 510 and a statistics course chosen in consultation with faculty adviser.
- 542 (3) Critical Thinking in Nursing Practice – Development of critical thinking and accountability through a systematic analysis and application of a nursing model. Clinical experience will be in the student's area of practice. Prerequisite or corequisite: NURS 510.
- 543 (3) Concepts in Clinical Nursing – Analysis of selected concepts within the context of a conceptual model for nursing and exploration of their relevance in nursing practice. Prerequisite: NURS 542.
- 546 (3/5) c Nursing and the Delivery of Health Care – The structure and process of health care delivery, social policy, political process, consumerism and bureaucratic influences in the Canadian health care system. A field experience is required for students taking the course for five credits.
- 548 (3/6) c Clinical Specialization I – The role of the clinical specialist and its development in health care systems. Identification and implementation of the theory and skills fundamental to the student's clinical speciality. A practicum is required for students taking the course for six credits. Prerequisite or corequisite: NURS 510, 542, and 543.
- 564 (6) Curriculum Development in Nursing – Curriculum development as it applies to nursing education. Prerequisite: NURS 510.
- 574 (6/12) c Administration in Nursing – Organizational behaviour, management methods and administrative processes and their application to nursing service and nursing education. A practicum is required for students taking the course for 12 credits. Prerequisites: NURS 510, 522, 542, 543, 546 and COMM 329, or equivalent.



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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

- 580 (6) Teaching in Clinical Nursing – Instructional design and its implementation in a variety of educational settings in nursing. A practicum is required. Prerequisites: NURS 510, 542, 543 and 564.
- 588 (9) Clinical Specialization II – Directed study in clinical nursing. Focus of study determined by student, dependent upon faculty and clinical resources. Prerequisites: NURS 522, 542, 543, 546 and 548.
- 590 (3/6) c Directed Studies in Nursing Prerequisites: NURS 522, 542, 543 and 546.
- 595 (0) M.S.N. Major Essay
- 599 (6) Master's Thesis Prerequisites: NURS 510, 522, 542 and 543.
- 601 (0) Doctoral Seminar
- 608 (6) Philosophy of Nursing Science – Constructs and theories in nursing science, focusing on both theoretical analysis and empirical investigation.
- 623 (3) Advanced Concepts in Quantitative Research Methods – Application of selected quantitative methods to the discipline of nursing. Prerequisites: HCEP 400 or EPSE 592. Prerequisite or corequisite: EPSE 596 or EPSE 682.
- 624 (3) Advanced Concepts in Qualitative Research Methods – Application of selected qualitative methods to the discipline of nursing.
- 690 (3/6) c Directed Studies in Nursing
- 699 Ph.D. Thesis
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- Obstetrics and Gynaecology OBST**
FACULTY OF MEDICINE
- 425 (1) 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 fetal physiology.
- 450 (8) Principles of Obstetrics and Gynaecology – Obstetrics: Lectures on normal and abnormal obstetrics. Gynaecology: Lectures on common gynaecological disorders. Seminar and patient-oriented teaching and demonstrations to small groups of students supplement lectures.
- 475 (12) Obstetrics and Gynaecology Clinical Clerkship – Six weeks experience in two different hospitals. Patient care responsibilities are complemented by scheduled rounds and seminars. Gynaecology: Common problems in ambulatory care and surgical gynaecology. Obstetrics: Clinical experience in the delivery of antenatal care including high risk conditions, as well as intrapartum and post-partum care.
- 501 (3) Reproductive Endocrinology I – Neuroendocrine regulation of reproduction, regulation of the ovarian and testicular function.
- 502 (3) Physiology of the Mother, Fetus and Newborn – Functional development of the placenta and major organ systems in the fetal and newborn period in man and animals.
- 503 (3) Perinatal Physiology – (i) Fetal growth and development; (ii) physiology and pathology of labour.
- 504 (3) Reproductive Endocrinology II – Lectures and seminars on cellular processes in hormone secretion, steroid biosynthesis, steroid transport and metabolism, mechanism of hormone action, prostaglandins in reproduction.
- 505 (6) Experimental Techniques in Reproductive Biology – Laboratory course on: cell and organ cultures, radioimmunoassay of steroid and protein hormones and prostaglandins, in vitro fertilization, neuroendocrine techniques, techniques to study fetuses, techniques for metabolic studies in newborn animals.
- 506 (3) Seminars in Reproductive Biology
- 549 (12) M.Sc. Thesis
- 649 Ph.D. Thesis
- 700 Grand Rounds – Weekly presentation of case histories of current interest with discussion of the clinical problem and relevant literature. At these rounds, reports of clinical research studies are presented and outside guest speakers may present papers. One hour weekly.
- 701 Seminar Series in Obstetrics and Gynaecology – A weekly two-hourly session, with consideration at a postgraduate level of appropriate topics in gynaecology and obstetrics and in those areas that interface with other disciplines.
- 702 Clinical Genetics Clinic – An elective rotation three days per week for three months through the Clinical Genetics Clinic dealing with the techniques of the prenatal diagnosis of genetic disease and genetic counselling relative to congenital malformations and failures of reproduction.
- 704 Human Sexuality – An elective experience in the Division of Sexual Medicine in the Department of Psychiatry. Instruction in interviewing, assessment, and treatment of individuals and couples with problems in sexual function. Part-time rotation two days per week for three month period.
- 709 Intensive Care Seminar – Problems and possible pitfalls of the high-risk pregnancy and maternal and neonatal management, selected from current clinical problems in the Intensive Care Nursery. Emphasis on possible neonatal consequences of maternal management and considerations to be communicated to the Obstetrician antenatally. The importance of differences in management according to the specialization of facilities is stressed. One hour weekly.
- 712 Perinatal Mortality Conference – Discussion of perinatal mortality cases for the month, with review of clinical course, pathological findings and preventable aspects. Two hours monthly.
- 778 Gynaecological Oncology Rounds – Case presentation and discussion of current patients on the gynaecology oncology service – weekly one hour conjoint rounds of the C.C.A.B.C. radiotherapy staff and gynaecologists active in gynaecological oncology.
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- Occupational Hygiene OCCH**
FACULTY OF GRADUATE STUDIES
- 401 (3) Introduction to Occupational Hygiene and Safety – Scientific basis for the recognition, evaluation, and control of chemical, physical, and biological hazards encountered in occupational settings; health and safety standards; exposure measurement methods; and evaluation strategies. Prerequisite: 3rd or 4th year standing in the Faculty of Applied Science, Science, or one of the health sciences; other upper level students may enrol with the permission of the instructor. Credit will be given for only one of OCCH 401 or OCCH 501. [3-0; 0-0]
- 501 (3) Introduction to Occupational Hygiene and Safety – Scientific basis for the recognition, evaluation, and control of chemical, physical, and biological hazards encountered in occupational settings. Epidemiological methods for occupational and environmental exposures; health and safety standards; exposure measurements methods; and evaluation strategies. Credit will be given for only one of OCCH 401 or OCCH 501. [3-0; 0-0]
- 502 (3) Chemical and Biological Hazard Measurement – Industrial hygiene and environmental exposure monitoring, methods, and instrumentation; theory of atmospheric and biological sampling and analysis. Laboratories demonstrate workplace sampling and analysis techniques. Prerequisite: OCCH 501. [0-0; 2-3]
- 503 (3) Chemical and Biological Hazard Control – Design and evaluation of control strategies for occupational and environmental exposure. Engineering control methods; design of industrial ventilation systems; substitution and isolation strategies; administrative control measures; personal protective equipment. Prerequisite: OCCH 501. [0-0; 3-2*]
- 504 (3) Advanced Occupational Hygiene Issues – Toxicokinetics; physiologically-based pharmacokinetic models; biological markers of occupational and environmental exposures; exposure modelling; ethics and labour-management interaction in the practice of occupational hygiene. Prerequisites: HCEP 507 and OCCH 502. [3-0; 0-0]
- 505 (3) Ergonomics and Safety – Human factors in workplace design, anthropometry, work physiology; safety management; systems analysis; accident investigation; collection of accident data; fault trees; total loss control. [3-0; 0-0]
- 506 (3) Occupational Hygiene Practice – Application of occupational hygiene principles to actual worksites; using field investigations and interactive seminars on evaluation strategies, critical appraisal of results, and communication with labour and management. Prerequisite: OCCH 502 and 503. [2-3; 0-0]
- 507 (3) Research methods in Exposure Assessment and Epidemiology. – Assessment of occupational and environmental exposure for research purposes, validity, bias, precision in studies of exposure and disease. Prerequisites: introductory statistics, and OCCH 501 or HCEP 512.
- 530 (2-6) d Directed Studies.
- 595 (0) Occupational Health and Safety Seminar – Current occupational health and safety research; issues in hygiene programme management. [1-0; 1-0]
- 598 (6) Project – Applied occupational hygiene project on approved topic based on practicum; requiring written and oral report.
- 599 (12) M.Sc. Thesis
-
- Oceanography OCGY**
FACULTY OF SCIENCE
- 308 (3) Introduction to Physical and Chemical Oceanography – History and development of oceanography; methods: ocean basin structure; properties of seawater; salinity, temperature and density distributions; circulation; waves and tides; acoustics, the oceans and climate. Prerequisite: completion of First Year Science. [3-0; 0-0]
- 309 (3) Introduction to Biological and Geological Oceanography – Organisms in the sea and their relation to the physical and chemical environment; marine sediments and their relationships to biologic and physical processes. This course is the same as BIOL 305. Prerequisite: OCGY 308 is recommended. [0-0; 3-0]
- 310 (6) The Oceans – An introduction to the oceans for non-science students. The course provides a comprehensive review of oceanography, dealing with basic topics, including the motion and composition of ocean waters, life in the sea, the age and composition of the sea floor, and a history of the exploration of the oceans and its impact on human culture. Applied aspects such as: food from the sea; mineral and oil exploitation; pollution; navigation; military uses and the law of the sea, are also included. Not open to students in the Faculties of Science and Applied Science. This course is not open to first-year students. [3-0; 3-0]
- 405 (3) Introductory Dynamical Oceanography – Physical properties of seawater, hydrostatics, continuity, geostrophic and wind-driven currents, waves and tides. Prerequisite: OCGY 308. Students with strong backgrounds in Physical Sciences or Mathematics should take OCGY 414. Credit may be obtained for only one of OCGY 414 and 405. [3-0; 0-0]
- 406 (3) Biological Oceanographic Methods – Analytical techniques and field operations as used in biological oceanography. Pre- or co-requisite: OCGY 309/BIOL 305, or permission of the Head of the Department. BIOL 403/OCGY 406 are the same course. [1-4; 0-0]
- 407 (3) Introduction to Marine Chemistry and Geochemistry – Elemental abundance in seawater and marine sediments; solution chemistry of seawater; chemical and mineralogical composition of sediments; the carbonate system; or-

- ganic matter in the sea; gases; the nutrient elements; heavy metals; geochemical balance in the oceans. Prerequisite: one of OCGY 308, 309 or CHEM 301. [0-0; 3-0]
- 408 (3) Oceanographic Methods – Oceanographic instrumentation, methods of study and the analysis of oceanographic data. A field trip may be required. Prerequisite: OCGY 308. Open to third and fourth year students in Oceanography, or with permission of the Head of the Department. [0-0; 3-0]
- 409 (2) Waves and Tides – A review of observations on, and of the physics of the various kinds of oceanic waves, including tides, and their effects on coastal features. Corequisite: OCGY 414 or 405. [0-0; 2-0]
- 410 (3) Marine Pollution – An interdisciplinary study of pollution, with examples drawn from coastal and oceanic environments, including areas of local interest. Intended for third and fourth year students with a background in the sciences. [3-0-0]
- 411 (3) Atmospheric Dynamics – Applications of dynamical principles to motions in the atmosphere. Topics include the planetary boundary layer, synoptic-scale motions, cyclogenesis and the general circulation and numerical weather prediction. Prerequisites: PHYS 312 or MATH 316, and ATSC/GEOG 301. (Same as ATSC 411.) [0-0; 3-0]
- 412 (2) Marine Microbiology – An introduction to the diversity and activities of bacteria, yeasts, and filamentous fungi in coastal and oceanic ecosystems. Emphasis will be given to the roles of these microbes in nutrient cycling and as symbionts of marine organisms. Prerequisites: MICB 200 or permission of the Head of the Department. [0-0; 2-0]
- 413 (3) Estuaries – An interdisciplinary study of the features and the physical, chemical, biological and geological processes in estuaries. Prerequisites: OCGY 308, 309 and fourth year standing or permission of the Head of the Department. [3-0; 0-0]
- 414 (3) Geophysical Fluid Dynamics – The fundamental principles governing the flow of a density-stratified fluid on a rotating planet, with applications to the motions of the ocean and atmosphere. Prerequisite: PHYS 312 or MATH 316. (Same as ATSC 414.) [3-0; 0-0]
- 415 (3) Algal Physiology – Environmental physiology of marine algae with emphasis on physiological adaptations to environmental factors. Laboratory features culturing of algae and analytical techniques useful in measuring physiological response to environmental changes. Prerequisites: BIOL 320 and one of BIOL 351/352, BIOL 350 or BIOL 201 (may be taken concurrently). Same as BIOL 451. [0-0; 2-3]
- 416 (3) History of the Ocean Basins – Development of ocean basins over geological time; paleoceanography and paleoclimatology. Prerequisite: GEOL 426 or permission of the Head of the Department. [0-0; 3-0]
- 420 (3) Introduction to Fisheries Science – An introduction to the ecology and management of freshwater and marine fisheries. Topics include: population dynamics, species interactions, communities, environmental influences, stock assessment, economics and sociology of fisheries. Laboratories will consist of numerical analyses and simulations. [0-0-0; 2-0-3]
- 448 (2-6) c Directed Studies – A course to allow students to study a specific topic as agreed upon by a faculty member and student with written permission of the Head of the Department.
- 449 (6) Oceanographic Research – Directed investigation based on field or laboratory studies requiring a written scientific report and final oral examination. For Honours students only.
- 501 (2-6) d Seminar in Physical Oceanography – Oral presentations by students of current research of their own or from the literature. Topics chosen in consultation with faculty.
- 502 (2) Marine Geochemistry – Geochemistry of marine sediments and geochemical cycles in the ocean.
- 503 (2) Oceanographic Methods – Oceanographic instrumentation, design of experiments, processing and analysis of data. (For graduate students in Oceanography planning field programs.) Prerequisites: OCGY 308, and OCGY 414, 405 or 514.
- 504 (2) Organic Chemicals in the Marine Environment – The role of organic substances in the ocean. Detailed consideration of man-made pollutants and naturally occurring materials. Chemistry of the compounds and their synthesis by organisms or by industry. Chemical ability of the compounds and their environmental degradation. Ecological impact, oceanographic distribution and potential use of organic substances as oceanographic tracers. Trace metal-organic interactions.
- 505 (2-6) c Special Advanced Courses – A special advanced course may be arranged for a student upon approval of the Head of the Department.
- 506 (3) Marine Phytoplankton Ecology – Emphasis on the biology of the organisms and the physiological ecology of primary production by phytoplankton. OCGY 308 and 309 are recommended. Offered in alternate years.
- 507 (2) Zooplankton Ecology – A study of marine zooplankton, the interrelationships of the species, their biology and relations to the environment. Prerequisite: OCGY 308. Given in alternate years.
- 509 (2) Biological Oceanographic Mechanisms – A study of components in the pelagic food chain of the sea including factors affecting the production and consumption of marine organisms. Prerequisite: OCGY 308.
- 511 (3) Inorganic Chemical Tracers in the Study of Marine Systems – The chemical composition of seawater, cycles of gases, trace metals and radionuclides within the sea, chemical tracers in the study of water mixing, water movement and changes in ocean currents over time.
- 512 (3) Inorganic Chemical Processes in the Marine Environment – The solution chemistry of seawater, chemical speciation in natural waters, thermodynamic and kinetic modelling of marine chemical systems.
- 513 (1-2) c Seminar in Biological Oceanography – A course to allow students the opportunity to present their own work, or that of others, orally. Topics will be chosen in consultation with faculty. Students will be expected to present at least one seminar during the term and to participate in the discussion of other seminars. Students in biological oceanography will normally take the seminar twice during their tenure at UBC.
- 514 (4) Dynamic Oceanography – Dynamics of steady ocean circulation and low frequency fluid motion on a rotating earth. Corequisite: OCGY 308. Credit will not be granted for both OCGY 414 and 514.
- 515 (3) Water Waves – Surface and internal gravity waves; theory and observations. Wave-wave and wave-current interactions; wind-wave generation; tidal theory and prediction. Offered in alternate years.
- 516 (2) Advanced Physical Oceanography – Topics in waves, eddies and ocean circulation. Prerequisite or corequisite: OCGY 514. Offered in alternate years.
- 517 (4) 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. Offered in alternate years.
- 518 (3) Dynamic Meteorology – Applications of the equations of motion on a rotating sphere to selected large-scale atmospheric phenomena. Topics include the general circulation, wave generation and propagation, barotropic and baroclinic instability, climate modelling and the role of the oceans. Offered in alternate years.
- 519 (3) Seminar in Marine Sediment Geochemistry – A review of selected areas of recent research on the geochemistry of marine sediments. This course is intended for graduate students with qualification in chemistry or geochemistry.
- 526 (3) Satellite Remote Sensing: Applications to Oceanography and Meteorology – A review of the satellite-sensed data products used in research and operational aspects of oceanography and meteorology. This course is the same as GEOG 515.
- 549 (6/12) c M.Sc. Thesis
- 589 (0) M.Sc. Major Essay
- 649 Ph.D. Thesis

Ophthalmology **OPHTH**
FACULTY OF MEDICINE

- 390 (1) An Introduction to Diseases of the Visual System – This course is primarily directed toward itinerant teachers of the visually disabled and will be given as 15 hours of lectures.
- 425 (1) Introduction to Ophthalmology – Background skills of ophthalmological examination of patients.
- 450 (1) Ophthalmology – Third year Medicine Students only: An introduction to Clinical Ophthalmology. Four morning sessions introducing the third year Medical Students to basic ophthalmic history, clinical symptoms, signs and patient management.
- 700 Ophthalmology Rounds – Demonstration, review of signs and symptoms, etiology, pathogenesis and treatment of current general ophthalmic disorders. One and one half hours weekly.
- 702 Ophthalmic Microbiology – Supervised demonstration, diagnosis and discussion of microbiology problems, involving patients, slides and cultures. One hour weekly.
- 703 Ophthalmic Pathology I – Supervised demonstration, discussion and tutorial of current ophthalmic pathological specimens. One and one half hours weekly.
- 704 Ophthalmic Pathology II – Clinicopathological correlation of ophthalmic specimens. One hour weekly.
- 705 Neuro-ophthalmology – Lectures and seminars to cover the important and common neuro-ophthalmic disorders, emphasizing etiology, pathogenesis, treatment and investigation. One hour weekly.
- 706 Retina and Fluorescein Angiography Tutorial – Lectures and demonstrations of retinal disease, study and interpretation of fluorescein angiograms. One and one half hours weekly.
- 707 Glaucoma Tutorial – Lectures and demonstrations to cover signs, symptoms, pathogenesis, etiology, investigation and treatment of ocular hypertension. One hour weekly.
- 708 Ocular Motility Tutorial – Lectures and demonstrations of motility problems, with clinicopathological correlations. One and one half hours weekly.
- 709 Ophthalmic Research – During the first year of ophthalmic training for those residents choosing this selective activity.
- 710 Lectures in anaesthesiology, radiology, radiotherapy – Two hours per week.

Oral Biology **ORBI**
SEE DENTISTRY

Oral Medical and Surgical Sciences **OMSS**
SEE DENTISTRY

Orthopaedics **ORPA**
FACULTY OF MEDICINE

- 425 (1) Introduction to Orthopaedics – Introduction to the art and practice of history taking, and of physical examination of the musculoskeletal system.
- 450 Principles of Orthopaedics – Clinical manifestations and principles of treatment of musculoskeletal disease in adults

- and children, both in Outpatient and Inpatient clinical settings.
- 475 Orthopaedic Clinical Clerkship – An elective two-week Clinical Clerkship in orthopaedics. Participation in preoperative and postoperative patient care under supervision of an Orthopaedic Faculty Member. On request the elective may be extended for a further period of 4 to 8 weeks, and may be structured to allow special exposure to one or more sub-specialities in the field of orthopaedics.
- 508 (2) Advanced Orthopaedics I – Selected topics in orthopaedic surgery and related basic sciences. Given in alternate years.
- 509 (2) Advanced Orthopaedics II – The second year of the above program which will be given in alternate years.
- 715 Orthopaedic Clinic – Evaluation of new patients and diagnosis and treatment of appropriate diseases. Basic signs and clinical features are both stressed in the total management of the patient. Two hours per week in the Outpatient Department under supervision of an Orthopaedic Faculty member.
- 716 Orthopaedic Bedside Clinic – Evaluation of orthopaedic diseases and injuries in patients at bedside. A review of clinical features is correlated with relevant physiology and pathology.
- 717 Orthopaedic Grand Rounds – Formal presentations by the orthopaedic residents, under the supervision of assigned faculty members. Subject matter includes the whole spectrum of orthopaedics.
- 718 Rheumatology Conference – Patients with a variety of rheumatological disorders are presented for discussion and evaluation in this combined conference, which rheumatologists and orthopaedic surgeons who have a special interest in reconstructive surgery attend. During each weekly two hour session, patients with difficult management problems are presented for clinical evaluation and discussion of medical and orthopaedic treatment.
- 719 Orthopaedic Surgical Anatomy – A course in clinical anatomy as applied to orthopaedics. A regional approach involving surgical dissections in cadavers. Each session lasts one hour and is supervised by a Faculty member. Emphasis is on surgical anatomical approach.
- 720 Orthopaedic Basic Science Course – Weekly lectures by orthopaedic faculty and guest faculty from other departments. Lecture topics include applied physiology, anatomy, and pathology as they relate to orthopaedic diseases.
- 721 Orthopaedic Seminars – A series of seminars is given weekly, and during each 1.5 hour session, a topic in clinical orthopaedics is reviewed. The subject matter includes the whole spectrum of orthopaedics. One or more faculty members are in attendance at each seminar.
- 722 Paediatric Orthopaedics – Case presentation in paediatric orthopaedics, stressing history, physical findings and total management of the patient, including a review of paediatric fractures with x-rays.
- 723 Orthopaedic Surgery – The practical application of orthopaedics in the operating room with discussion of techniques of surgery, anatomy, pathology, pathophysiology and complications of diseases.
- 724 Trauma Rounds – Orthopaedic traumatology is reviewed, with emphasis being placed on applied basic science, surgical anatomy, diagnosis and definitive management. These sessions are supervised by a faculty member and are held weekly, each session lasting one and one half hours.
- 725 Bone Tumour Registry – A review of bone tumour and related problems with presentation of clinical and laboratory information, radiographs and pathological materials. One and one half hours monthly.
- 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 post-graduate students proceeding to Certification and Fellowship of the Royal College of Physicians and Surgeons of Canada.
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- Otorhinolaryngology**
SEE SURGERY, FACULTY OF MEDICINE
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- Paediatrics** **PAED**
FACULTY OF MEDICINE
- 425 (2) Introduction to Paediatrics – Fourteen hours of lectures and seven four-hour clinical sessions, which serve as an introduction to growth and development, clinical appraisal of healthy and handicapped children, understanding the mother-child relationship, history taking and physical examination and certain fundamental aspects of child health care.
- 450 (8) Principles of Paediatrics – 1. This is a series of lectures and clinics devoted to paediatrics. Students are as far as possible taught in small groups. 2. Students are assigned to the Department of Paediatrics for four days a week for a one-month period. This time is devoted primarily to methods of history-taking and physical examination of infants and children. Morning clinics of two hours a day are held for four weeks. The students are encouraged to follow up their cases insofar as time allows.
- 451 Paediatric Infection and Immunity – Pathophysiology of infection and the immune response in the young host. Third year elective.
- 452 (3) Health Problems in the Adolescent – A review with particular regard to application of Behavioural Sciences. Third year elective.
- 475 (12) Paediatrics – Students are assigned to the Department of Paediatrics for 6 weeks. They are responsible for patient histories, physical examinations, participate in investigation and management, and follow patient progress under direct Resident and Staff supervision. They take part in daily rounds of their ward and the Department. On evenings and weekends, students are on duty on a regular rotation to observe and participate, under supervision, in the care of newly admitted patients.
- 700 Grand Rounds – Lecture or group presentation of current paediatric topics or advances in paediatrics followed by discussion. One hour weekly.
- 701 Case Management Rounds – Case presentations and discussion of interesting patients, often of a problematic nature, with a review of the current knowledge of the particular disease or malformation presented. One hour weekly.
- 702 Fundamental Principles of Paediatric Haematology – A review of encountered problems related to paediatric haematology, with particular reference to childhood anaemias and leukaemias and investigation thereof.
- 703 Seminars in Paediatric Nephrology – A review of renal pathology and clinical manifestations of anatomical abnormalities and diseases of the urinary tract.
- 704 Paediatric Neurology – A series of seminars, group discussions and case presentations, with emphasis on neurological examination and Gesell testing of normal and abnormal infants and children. Common neurological problems are presented and discussed.
- 705 Paediatric Emergencies and their Treatment – A course held twice weekly for two months, as an introduction to emergency situations in paediatrics.
- 706 Paediatric Surgery – A clinically-oriented course with case presentations of surgical conditions particularly related to childhood. One hour weekly.
- 707 Basic Science Seminars in Neonatology – A scientific review of problems encountered in the foetus or newborn infant. A literature review incorporating the most recent information is presented and a scientific basis for diagnostic, preventive or treatment aspects is considered. One to two hours weekly.
- 708 Neonatal Radiology Seminar – An organized group of current case presentations based on radiographic films in which the diagnosis or evaluation of progress in a new born infant is discussed. The limits of diagnostic usefulness, and suggestions for subsequent investigation and management are explored. One hour weekly.
- 711 Special Problems in Intensive Care – A group of special problems in the Intensive Care Nursery are presented and discussed from the standpoint of etiology, diagnosis, management and ultimate outcome. One to two hours weekly.
- 712 Perinatal Mortality Conference – Discussion of perinatal mortality cases for the month, with review of clinical and laboratory findings, management and pathology findings by paediatric, obstetrical and pathology teaching staff. Methods of possible prevention of foetal or neonatal death are discussed and recommended as hypothetical reasons for preventability, when appropriate. Two hours monthly.
- 713 Seminars in Biochemical Paediatrics – A series of discussions on clinical problems which are chosen to illustrate the biochemical basis for the practice of paediatrics.
- 714 Paediatric Pathology – Demonstration and dissection of congenital heart lesions; correlation of cardiological and pathological data. One hour weekly.
- 715 Paediatric Cardiology – A review of cases investigated during the previous week with demonstration of the investigative findings and discussion of the plan of management. One hour weekly.
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- Paediatric Surgery**
SEE SURGERY, FACULTY OF MEDICINE
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- Pathology** **PATH**
DEPARTMENT OF PATHOLOGY AND LABORATORY
MEDICINE, FACULTY OF MEDICINE
- 300 (6) Background to Medical Laboratory Science – Introductory lectures and laboratory sessions in clinical chemistry, haematology and blood banking, hospital microbiology, preparation and examination of tissue sections. For Medical Laboratory Science students without previous experience in hospital laboratories. Prerequisites: BIOL 200, 201; CHEM 205, 230; MICB 200. [3-4; 0-0]
- 301 (4) Introduction to Medical Laboratory Science – An integrated approach to specific areas of the theoretical and practical aspects of those physical and biological sciences relevant to medical laboratory science. Emphasis will be placed upon the application of basic science to those clinical disciplines practised by the medical laboratory scientist, e.g., histochemistry, clinical chemistry, microbiology, haematology, etc.
- 303 (4) Medical Laboratory Science – Principles of Tissue – Tissue culture techniques in clinical diagnosis; cytological techniques used in the diagnosis and control of cancer. Sex chromatin determination.
- 304 (4) Medical Laboratory Science - Normal Human Histology – An advanced lecture and laboratory course in the microscopic structure of the human body necessary for a complete understanding of histochemistry and histopathology.
- 305 (4) Modern Microscopy – A lecture and laboratory course in the theoretical and practical application of modern biological microscopes - compound, dissecting, comparison, dark ground, fluorescent, phase contrast, interference and electron microscopes.
- 306 (2) Nuclear Medicine for Medical Laboratory Scientists – Introductory Nuclear Medicine with specific reference to the Pathology laboratory.
- 375 (2) Introduction to Human Pathology – A lecture-demonstration course designed to acquaint students in the allied health professions with a basic understanding of the causes, natural history, and pathophysiology of common disease processes. Prerequisite: BIOL 101 or 102, CHEM 103, 110

- or 120, PHYL 301, BIOC 300, ANAT 390 and ANAT 501 or their equivalents.
- 390 (4) Basic Pathology – A lecture course for students in allied health sciences designed to review basic pathologic processes involving various body systems. [2-0; 2-0]
- 401 Principles of Pathology – A lecture and seminar course designed for dental students and dealing with the understanding of human diseases.
- 402 (4) Medical Laboratory Science – Haematology – A theoretical and practical examination of those modern concepts of haematology which relate to the practice of medical laboratory science.
- 404 (6) Diagnostic Histochemistry – A lecture and laboratory course that encompasses the theory and the practice of currently available histochemical techniques. This course is to supplement the histopathological technique course taken as a requirement for CSET (RT) certification.
- 405 (2) Seminars in Current Topics – This seminar course is intended to train students in the oral presentation of scientific papers and make them critically aware of the current literature. They will be assigned, on a rotational basis, current issues of journals in the field of laboratory medicine. In consultation with faculty they will select one or more papers for review in a 15-20 minute presentation. The presentation will be followed by a general discussion.
- 406 (6) Medical Laboratory Science – Clinical Chemistry – This course will review and discuss the methodology of clinical chemistry in order to put these analytical methods into the broad perspective of the pathophysiology of human disease and biochemistry.
- 407 (4) Medical Laboratory Toxicology – Analytical, Clinic – A theoretical and practical examination of analytical and pathophysiological aspects of clinical and forensic toxicology. Prerequisites for students not registered in the Bachelor of Medical Laboratory Science program: BIOC 300, CHEM 311 and PATH 575 or their equivalents.
- 408 (5) Medical Laboratory Science – Laboratory Administration – Personnel management, staff management relationships, stock control, record keeping etc. Medicolegal aspects of medical laboratory science. Theory and practice of quality control. Use of computers in the medical laboratory.
- 415 (2) Immunopathology – Immunological events causing tissue injury.
- 417 (5) Microbial Infection in Humans – Determinants in host and microbe which affect the course and expression of disease in humans, emphasizing the relative importance of the host. Prerequisite or corequisite: MICB 403.
- 425 (1/2/1/4) d 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 biochemistry 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. Two terms.
- 427 (8) Bacteriology, Mycology, Virology – Pathogenic microorganisms (bacteria, viruses, parasites, fungi) for humans will be studied and the emphasis will be placed on the understanding of basic biology of microorganisms, epidemiology of infection, pathogenesis of disease, clinical features and course of illness, clinical and laboratory diagnosis, treatment, and prevention. Additional study topics include antibiotics, defence mechanisms and principles of infection control. For students in the Faculty of Medicine.
- 437 (5) Viral Infections – Interactions between viruses and humans; pathogenesis; prompt virological diagnosis; rationale for antiviral chemotherapy and prophylaxis. Corequisite MICB 408. [0-0; 2-4]
- 438 (2-6) c Medical Laboratory Science – Directed Studies – Investigation of a specific topic in Medical Laboratory Science. Permission of the Head of the Department is required.
- 447 (0-3) Directed Studies – A special elective program of directed studies in clinical or molecular microbiology for students who have completed third year science courses in a major program in microbiology.
- 448 (2) Introduction to Laboratory Medicine – An elective course open to first year medical students who spend at least three consecutive hours each week in one of the affiliated hospitals of the Department of Pathology, Vancouver General Hospital, under the joint supervision of a Senior Resident in Pathology and the Professional Staff of the following Divisions: anatomical pathology, clinical biochemistry, haematology, paediatric pathology. Enrollment is limited.
- 450 Systemic Pathology – A series of Pathology discussions in conjunction with various clinical departments designed to illustrate the role of Pathology in the diagnosis and management of various diseases.
- 451 (3) Clerkship in Laboratory Medicine – An elective course open to third-year medical students, designed to familiarize the student with various subspecialties of Laboratory Medicine, including Haematology, Clinical Biochemistry, and Nuclear Medicine. This elective may involve attendance at one or more affiliated hospitals. Registration requires consent of the Department and enrolment may be limited.
- 452 (3) Clerkship in Anatomic Pathology – An elective course open to third-year medical students, designed to familiarize the student with Anatomic Pathology, including Surgical Pathology, Paediatric Pathology, Autopsy Pathology and Cytology. This elective may involve attendance at one or more affiliated hospitals. Registration requires consent of the Department and enrolment may be limited.
- 453 Clinical Laboratory Haematology – Correlative seminars based on haematology case studies relating clinical features to laboratory investigations. Same as MED1 452.
- 457 (3) Clinical Laboratory Microbiology – Selected clinical laboratory exercises plus seminars to illustrate the diagnosis and management of patients with microbial infections. Elective course limited to Third and Fourth Year medical students. Departmental approval.
- 467 (3) Microbiological Infection Control – Lectures and practical exercises on recognition, identification, clinical significance, and control of pathogenic organisms in hospitals and clinics. (Correspondence course now available.) Prerequisite: MICB 153, or equivalent. [0-0; 3-1]
- 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.
- 500 (2-8) d General Principles of Pathology – General principles of etiology, pathogenesis, disordered physiology and anatomic pathology of common disease processes, with emphasis on experimental approaches.
- 501 (2-6) c Systemic Pathology – Diseases affecting the renal, genitourinary, cardiovascular, pulmonary, gastrointestinal, female reproductive, haematopoietic, endocrine, bone and joint, and central nervous systems will be described.
- 502 (6) Histochemistry in Pathology – A lecture and laboratory course that encompasses the theory and the practice of currently available histochemical techniques as applied to pathological material. A basic knowledge of Histology is preferable but not essential.
- 506 (2) Ultrastructural Pathology – A review of fine structure as seen in various pathological conditions. Prerequisite: a knowledge of Microscopic Anatomy and PATH 425 or 500.
- 509 (6) Viral Ecology – Range of virus infections for humans and other vertebrates; methods of spread; laboratory diagnostic procedures; biophysical and biochemical aspects; virus-cell interactions.
- 510 (4) Analytical Methods in Chemical Pathology – A survey of the application of the principles of analytical chemistry to the investigation of disease. A knowledge of basic analytical chemistry is a prerequisite.
- 512 (4) Chemical Pathology – A critical survey of current knowledge relating to the physiological and metabolic disturbances underlying disease.
- 515 (8) Experimental Pathology – A lecture and laboratory course designed to develop laboratory skills particularly applicable in experimental pathology. Prerequisite: PATH 500.
- 518 (2-4) c Pulmonary Pathophysiology – A review of current topics in pulmonary pathophysiology at an advanced level suitable for graduate students majoring in pathology, medicine, surgery or anaesthesiology. Topics will include lung anatomy, ventilation, blood flow, gas exchange and fluid and. Prerequisites: PATH 401, 425, or 500, and PHYL 301, 303 or 400, or equivalents.
- 520 (4) Recent Advances in Biopathology – A series of lectures with related reading designed to cover new concepts in Biopathology with emphasis on functional and structural alterations in disease. Prerequisites: M.D. or D.M.D. degree or PATH 500.
- 521 (6) Research Topics in Pathophysiology – A lecture and laboratory course reviewing current areas of research in Pathophysiology. Registration requires permission of the Department.
- 523 (3) Antimicrobial Chemotherapy – Classification, structure and mode of action of antimicrobial agents. In-depth comparison of factors affecting the activity of antimicrobials in vivo and in vitro. Prerequisite: MICB 200, PSTH 427 or equivalent.
- 525 (2) Immunopathology – Same as PATH 415, with research assignment. Prerequisite: PATH 425 or 500.
- 527 (2-6) c Bacteriology, Mycology – All groups of microorganisms pathogenic for humans. Clinical features, pathogenesis and pathology, epidemiology, properties of the agents, immunology, laboratory diagnosis, therapy, preventative measures.
- 529 (2) Research Techniques in Medical Microbiology – Advanced laboratory course emphasizing techniques currently used in microbiological research. For graduate students in Medical Microbiology Pathology.
- 531 (3) Biology and Genetics of Neoplasia – Same as MEDG 521. Credit will be given for only one of MEDG 421, MEDG 521, or PATH 531.
- 535 (2) Seminar – Attendance required of all M.Sc. candidates in the Department.
- 541 (3) Histopathology – Advanced training in cellular structure and function of both normal and injured tissue and cells examined by light level and electron microscopy. Emphasis on human tissue. (1-2; 1-2)
- 542 (3) Techniques in Cell Culture. – Principles and methods of culturing isolated cells using several representative animal cell types. Morphological and functional examination of normal cells and cells exposed to damaging agents or conditions. (0-0; 0-0)
- 547 (3) Techniques in Molecular Biology and Experimental P – Nucleic acid purification and characterization; restriction enzyme digests; northern and southern blotting; cloning; DNA sequencing; polymerase chain reaction technology; electron microscopy; fluorescein-activated cell sorting. [0-0; 0-6]
- 548 (1-6) c Directed Studies for M.Sc. Students
- 548 (1-12) c Directed Studies M.Sc. Students
- 549 (18) M.Sc. Thesis
- 560 (4) Radiopharmaceuticals in Nuclear Medicine – An analysis of practical and theoretical problems involved in the production and manufacture of radioactive drugs used in the diagnosis and treatment of human diseases with particular emphasis on short-lived nuclides. Quality control, B.P. and U.S.P. standards.

- 561 (2) In Vitro Assay Techniques in Medicine – Theoretical considerations concerning qualitative and quantitative in vitro assay techniques used in Nuclear Medicine. These include isotope dilution, competitive protein binding, radio-immunoassay, neutron activation analysis and gamma ray spectrometry.
- 562 (2) Clinical Nuclear Medicine – The clinical application in vitro and in vivo of radioactive visualization procedures in diagnostic and therapeutic nuclear medicine with emphasis on appropriate utilization of those procedures and their role in patient diagnosis.
- 575 (4) Forensic Pathology – Modern forensic practice for pathologists and others concerned with forensic sciences. Prerequisite: PATH 425.
- 635 (2) Seminar – Attendance required for all Ph.D. candidates in the department.
- 648 (2-6) c Directed Studies for Ph.D. Students
- 648 (1-6) c Directed Studies for Ph.D. students
- 649 Ph.D. Thesis
- 700 Pathology Conference – Review and analysis of current cases. Diagnostic and pathogenic significance of findings are assessed. One hour weekly.
- 701 Surgical Pathology – Five days per week one hour review of current diagnostic biopsy problems. Diagnostic and therapeutic implications are discussed.
- 702 Haematologic Pathology – Lectures and seminars on the pathology of haematological diseases. Two hours weekly.
- 703 Histochemical Pathology – A series of lectures and seminars to show current applications of histochemical techniques to contemporary pathological diagnosis. One hour weekly per quarter.
- 704 Haematologic Pathology – Analysis of pathology of bone marrow aspirates; taken in one half or whole year. One and one half hours weekly.
- 705 Clinical Chemistry – A series of lectures, seminars, tutorials and laboratory tuition to demonstrate the use of chemical analysis in clinical medicine. Two hours weekly.
- 706 Neuropathology – Sectioning of necropsy material with clinicopathological correlation. One hour weekly.
- 707 Neuropathology, Clinical correlation – Pathology of central nervous system disease demonstrated to clinical staff, stressing correlation with clinical diseases. Two hours weekly.
- 708 Dermatopathology – Clinicopathological correlation of dermal lesions. Discussion of pathogenesis, clinical course, and prognostic implications. One hour weekly.
- 709 Renal Biopsy Rounds – Weekly correlation between clinical status and pathological findings in several patients. (Same as MEDI 711.)
- 710 Hepatic and Gastrointestinal Pathology – Clinicopathological correlation of hepatic and gastrointestinal biopsy material with discussions of pathogenesis, etiology and therapeutic implications. Alternate weeks, one hour.
- 711 Cytology – Daily review of cytopathology. Analysis of cervical and sputum smears and pleural, gastric and bronchial aspirates with discussion of significance to patients, taken in one quarter of year.
- 712 Perinatal Mortality Conference – Discussion of perinatal mortality cases for the month, with review of clinical and laboratory findings, management and pathology findings by paediatric, obstetrical and pathology teaching staff. Methods of possible prevention of foetal or neonatal death are discussed and recommended as hypothetical reasons for preventability, where appropriate. Two hours monthly.
- 713 Seminars in Biochemical Paediatrics – A series of discussions on clinical problems which are chosen to illustrate the biochemical basis for the practice of paediatrics.
- 714 Paediatric Pathology – Demonstration and dissection of congenital heart lesions; correlation of cardiological and pathological data. One hour weekly.
- 720 Microbiological Diagnosis – Conduct of bacterial, fungal, parasitological, and viral laboratory tests relevant to the microbiological examination of patients. For medical residents.
- 721 Microbiological Diagnosis – Conduct of research on some aspect of clinical or basic microbiology. For medical residents.
- 722 Microbial Infections – Review in depth of syndromes caused by common human pathogenic bacteria, fungi and viruses including principles of current laboratory diagnostic procedures and the rational use of antibiotics and prophylactic agents.
- 725 Histopath Disease – Gross and microscopic changes associated with infections, and the pathophysiology involved in their development. The course includes seminars based on histological specimens. For Residents in Medical Microbiology, General and Anatomical Pathology, and Infectious Diseases.
- 730 Clinical Nuclear Medicine – See RADI 710.
- 731 Progress in Nuclear Medicine – See RADI 711.
- 732 Clinical Investigation/Research – See RADI 712.
- 733 Quality Correlation in Nuclear Medicine – See RADI 713.

Pharmaceutical Sciences PHAR FACULTY OF PHARMACEUTICAL SCIENCES

- 100 (4) Professional Practice I – An overview of the profession of pharmacy and contemporary standards of practice, with emphasis on the role of the pharmacist as a provider of drug information. Laboratory work includes development of skills in compounding and dispensing and in interpersonal communications. Corequisite: PHAR 211. [2-3*-0; 2-3*-0]
- 200 (4) Professional Practice II – Professional relationships; interactions with patients and with other health care providers. Patterns of medication use and abuse in society; the detection and resolution of medication problems. Corequisite: PHAR 311. [2-3*-0; 2-3*-0]
- 211 (8) Drug Delivery Systems I – Principles of the design, preparation and evaluation of oral drug delivery systems. [4-3*-0; 4-3*-0]
- 240 (3) Pharmacology for Nurses – A study of the effects, side effects, mechanism of action and interaction of drugs. Primarily intended for students in second year nursing. [3-0; 0-0]
- 300 (2) Professional Practice III – Pharmacy law and regulators, ethical principles and responsibilities, statistics and research design, critical analysis of the pharmacy professional practice research literature, contemporary issues in ambulatory practice. Prerequisite: successful completion of all required courses in the first two years of the pharmacy curriculum. [1-3; 1-3]
- 301 (3) Self-Medication Products – A study of non-prescription medications for the self-medicating patient. The pharmacist's role in recommending safe and effective drug preparations will be emphasized. Prerequisite: Successful completion of all required courses of the first two years of the pharmacy program. [0-0; 3-0]
- 311 (4) Drug Delivery Systems II – Principles of the design, preparation and evaluation of parenteral, intrapulmonary, dermal, ophthalmic, otic, nasal, rectal and vaginal drug delivery systems. [2-3*-0; 2-3*-0]
- 315 (4) Pharmacokinetics – Fundamental pharmacokinetic principles underlying the administration, absorption, distribution, metabolism and excretion of drugs administered as pharmaceutical dosage forms. Prerequisites: PHAR 211 and 311. [4-0; 0-0]
- 325 (4) Pharmaceutical Analysis – An introduction to quality control methods used to analyse drugs including: aqueous, non-aqueous, redox, complexometric and potentiometric, titrimetry; colorimetric, fluorometric, ultra-violet and infrared spectroscopy; paper, column thin-layer, gas-liquid, and high-pressure-liquid chromatography; biochemical tests and the use of radioisotopes in Pharmacy. Prerequisites: CHEM 230, registration in third year. [4-3; 0-3]
- 351 (3) Introduction to Pharmacy Management – Fundamental behavioural and managerial principles applied to pharmacy operations. Prerequisite: ECON 100 is strongly recommended. [0-0; 3-0] or [3-0; 0-0]
- 360 (3) Introduction to Pharmaceutical Biotechnology – An introduction to recombinant DNA technology used in the design and production of agents for the prevention, diagnosis and treatment of disease and a discussion of the ethical, economic and societal issues associated with these agents. [0-0; 3-0]
- 370 (4) Drugs: Chemistry, Pharmacology and Therapeutics I – Pharmacological, chemical and physical principles of defined groups of drugs; the relationship of chemical structure to biological activity; the treatment with these drugs of diseases commonly encountered in pharmacy practice. Drug groups will include those affecting the autonomic nervous system, local anaesthetics and selected others. The role of the pharmacist in the resolution of drug-related problems will be stressed. [0-0; 4-0]
- 380 (6) DRUGS: Chemistry, Pharmacology and Therapeutics II – Pharmacological, chemical and physical principles of defined groups of drugs; the relationship of chemical structure to biological activity; the treatment with these drugs of diseases commonly encountered in pharmacy practice. Drug groups will include: renal, cardiac, respiratory, endocrine and selected others. The role of the pharmacist in the resolution of drug-related problems will be stressed. [6-2*; 0-0]
- 385 (6) Drugs: Chemistry, Pharmacology and Therapeutics III – Pharmacological, chemical and physical principles of defined groups of drugs; the relationship of chemical structure to biological activity; the treatment with these drugs of diseases commonly encountered in pharmacy practice. Drug groups will include: gastrointestinal, psychotropic, neurological disorders, analgesics and selected others. The role of the pharmacist in the resolution of drug-related problems will be stressed. [0-0; 6-2*]
- 402 (6) Clinical Clerkship I-Ambulatory – Evaluation of drug use in the ambulant patient; developing family drug record plans to review prescribed and self-selected medication usage; comparative evaluation of non-prescription drug products within therapeutic classifications; methods of interprofessional and patient communication of above. Corequisite: PHAR 401.
- 403 (3) Clinical Clerkship II – Institutional – Pharmacy service in various types of hospitals ranging from acute to extended to speciality treatment objectives. Drug distribution methods, drug utilization control approaches, interprofessional relationships and specific patient drug therapy case studies are included. Corequisite: PHAR 401. [1-4]
- 404 (3) Drug Therapy for the Pediatric Patient – Introduction to the pediatric patient. Emphasis is placed on developmental pharmacology, pediatric disease states and their treatment, and drug therapy considerations specific to the pediatric population. Limited enrolment; permission from instructor required. Graduate and undergraduate students from other Faculties may be admitted. (3-0-0)
- 405 (2-6) c Problems in Clinical Pharmacy – Individual assignments involving library and clinical investigation of specific problems relating to drug utilization and information topics. [0-6; 0-6]
- 408 (4) Clinical Pharmacokinetics – Lectures and discussions of topics on the application of pharmacokinetic principles and the use of therapeutic drug level monitoring in clinical pharmacy practice. Prerequisite: Successful completion of all required courses in the first three years of the

- pharmacy curriculum. Permission of instructor required. [+0; 0-0] or [0-0; 4-0]
- 409 (3) Drug Therapy for the Geriatric Patient – A combination of lectures and workshops is used to address topics such as: the social, individual, physiological and pharmacological aspects of aging; major disease states occurring in the elderly and their respective drug and non-drug management; specific communication difficulties encountered with the elderly and methods of minimizing their impact on patient education and compliance. Permission of instructor required. [0-0; 3-0]
- 412 (4) 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 (6) Problems in Pharmaceutics and Biopharmaceutics – Individual assignments involving library and laboratory investigation of problems involved in the development of pharmaceutical dosage forms. [0-6; 0-6]
- 415 (4) Topics in Pharmaceutics and Biopharmaceutics – A study of selected topics in the field of pharmaceutics and biopharmaceutics. Registration restricted, permission of instructor required. [2-0; 2-0]
- 416 (4) Pharmaceutical Manufacturing – The formulation and production of pharmaceuticals including an introduction to selected pharmaceutical processes and plant protocol. Laboratory includes some individual formulation problems. Enrolment restricted. Permission of the instructor is required. [1-6*; 1-6*]
- 417 (4) Clinical Pharmaceutics of Dermatologic and Ophthalmic Products – A study of locally administered pharmaceutical products for the treatment and care of the skin and the eye. [2-0; 2-0]
- 425 (6) Drug Testing and Assaying – Modern analytical techniques applied to separation and analysis of pharmaceutical preparations and special methods employed in pharmaceutical research. Registration limited. [1-4; 1-4]
- 426 (6) Problems in Pharmaceutical Chemistry – Research and library thesis projects related to problems in analytical and synthetic aspects of drugs and natural products, and molecular aspects of drug action. Registration limited. [0-6; 0-6]
- 428 (2) A QSAR Approach to Drug Design – A detailed examination of substituent parameters and their use in quantitative structure-activity studies and drug design. Other methods of rational drug design as well as receptor models and effector mechanisms will be included. Prerequisite: permission of the instructor. [2-0; 0-0]
- 429 (2) Biochemical and Clinical Aspects of Drug Metabolism – A study of the major enzymes and the reactions involved in the biotransformation of drugs. Factors affecting drug metabolism, enzyme induction and inhibition, as well as pharmacokinetic models and drug interactions will be discussed. Prerequisite: permission of the instructor. [0-0; 2-0]
- 434 (6) 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]
- 435 (3) Pesticides – Chemistry, toxicology to target and non-target organisms, and usage of insecticides, herbicides and fungicides; metabolism, environmental fate and impact; regulatory, social and legal implications. (Offered in alternate years.) (Same as PLNT 435.) Prerequisite: CHEM 230. [3-0; 0-0]
- 437 (4) 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: permission of the instructor. [2-0; 2-0]
- 440 (3) Pain Research and Therapy – A multidisciplinary course dealing with basic mechanisms and the clinical management of acute and chronic pain. Prerequisite: PHAR 370 or permission of instructor. [3-0; 0-0]
- 444 (6) Problems in Pharmacology – Individual assignments involving library and laboratory investigation of certain aspects of drug action. Enrolment restricted. [0-6; 0-6]
- 448 (4) Environmental and Cellular Toxicology – Toxicology of heavy metals, pesticides; mutagenic, teratogenic and carcinogenic effects of drugs. Prerequisites: BIOC 300, PHYL 301 and 302, PHAR 370, 380, 385. [0-0; 4-0]
- 450 (2-6) c Selected Topics -- Thesis or Essay.
- 452 (3) Community Pharmacy Administration – Selected topics in the field of pharmacy administration. Registration restricted, permission of instructor required. Prerequisite: PHAR 351. [0-0; 3-0] or [3-0; 0-0]
- 453 (2-6) c Problems in Pharmacy Administration – Individual assignments involving library and field work investigations of problems associated with pharmacy administration, enrolment restricted. Prerequisite: Successful completion of the required courses of the first three years of the pharmacy curriculum.
- 454 (3) Hospital Pharmacy Administration – Organization, staffing, hospital pharmacy services and their development, economics and purchasing, drug use control, specialized services, new trends and developments. [3-0-0]
- 455 (4) Community Health Services and Pharmacy Practice – Issues in health care, community health services and pharmacy practice. [2-0; 2-0]
- 458 (3) Marketing Applications in Pharmacy – A detailed examination, through lectures, case studies and student projects, of marketing theory and practices as applied to community, institutional and industrial pharmacy, and to pharmacy organizations. Prerequisite: PHAR 351. Graduate students and undergraduate students from other Faculties may be admitted to the course with permission from the instructor. [3-0; 0-0] or [0-0; 3-0]
- 469 (0) Professional Practice Clerkship – A 160 hour clerkship normally completed during a 4-5 week period in the summer immediately prior to entering the fourth year clinical Pharmacy courses. Corequisites: PHAR 300 and 351.
- 480 (6) Drugs: Chemistry, Pharmacology and Therapeutics IV – Pharmacological, chemical and physical principles of defined groups of drugs; the relationship of chemical structure to biological activity; the treatment with these drugs of diseases commonly encountered in pharmacy practice. Drug groups will include: antimicrobials, chemotherapeutic agents and selected others. The role of the pharmacist in the resolution of drug-related problems will be stressed. [6-2*; 0-0]
- 500 (8) Pharmaceutical Research Techniques – Modern physical, chemical and biological techniques currently used in pharmaceutical research. Permission of instructor required. [2-6; 1-6]
- 501 (12) Advanced Pharmacotherapeutics – Pharmacotherapeutic intervention in selected acute and chronic diseases and disorders. Emphasis is on recommendations for and monitoring of drug therapy. Prerequisite: PHAR 401. Corequisite: PATH 425. [3-6; 3-6]
- 502 (4) Advanced Concepts in Pharmacokinetics – Models of linear and dose-dependent systems in pharmacokinetics including sustained release, volumes of distribution, drug clearance, metabolite kinetics, multiple dosing and computer modelling. Prerequisite: PHAR 315. [4-0; 0-0] or [0-0; 4-0]
- 503 (2-12) c Graduate Clinical Clerkship – This course will consist of clinical rotations of 4-6 weeks duration (20-40 hours per week, 2 credit/rotation) in selected speciality areas in medicine and clinical pharmacy. Students will be assigned to clinicians in the selected speciality who are members of either the Faculty of Medicine or Pharmaceu-
- tical Sciences and who are appointed as clinical instructors for this course. Rotations will take place at the site(s) where the majority of the clinician's practice is conducted.
- 508 (4) Advanced Applications in Clinical Pharmacokinetics – Pharmacokinetic applications in therapeutic drug monitoring and patient care; specific drugs and disease states; effects of age and concomitant drug administration. Prerequisite: PHAR 502. [4-0; 0-0] or [0-0; 4-0]
- 510 (2-6) d Advanced Pharmaceutics I – A study of physical and chemical properties of pharmaceutical systems with emphasis on formulation and preparative aspects.
- 511 (2-6) d Advanced Pharmaceutics II – A study of problems in pharmaceutics with emphasis on biopharmaceutical aspects.
- 512 (2) Advanced Pharmaceutics III – A study of problems in pharmaceutics with emphasis on aspects of quality evaluation.
- 514 (6) Advanced Drug Delivery Systems – Controlled release and targeted drug delivery systems. Advances in delivery systems for peptide and protein drugs. [3-0; 3-0]
- 521 (3) Advanced Medicinal Chemistry I – A study of the underlying physical and chemical parameters determining drug action in representative classes of drugs.
- 522 (2) Advanced Medicinal Chemistry II – A study of the theories and kinetics of drug receptor interactions and recent advances in the molecular properties of drug receptors.
- 530 (4) Advanced Pharmacognosy – A detailed study of selected compounds of biological origin useful in the fields of Pharmacy and Medicine.
- 533 (12-24) c Clinical Clerkships I – Required clinical rotations of 4 weeks duration in selected speciality areas in medicine and clinical pharmacy.
- 534 (2-12) c Clinical Clerkships II – Elective clinical rotations of 4 weeks' duration in hospital, office or clinic locations.
- 535 (2) Pharm.D. Seminar
- 540 (2-6) d Topics in Pharmacology – Lectures and supervised studies in selected areas of pharmacology. Enrolment restricted.
- 541 (3) Drug Metabolism and Toxicology – The biotransformation of drugs, pesticides, carcinogens and other foreign chemicals in animals and humans. The biochemical mechanisms responsible, particularly the cytochrome P-450 mono-oxygenases, will be emphasized. The formation of toxic reactive metabolites and their effects will be discussed. Enrolment restricted.
- 542 (3) Central Nervous System Pharmacology – A course comprised of lectures, assigned readings and reports on selected topics dealing with drug actions in the central nervous system. Given in alternate years. Permission of instructor required.
- 543 (3) Advanced Laboratory in Pharmacology – A laboratory course giving instruction in the methods and techniques used in pharmacological research. Registration limited. [0-0; 0-6]
- 544 (3) Physiology and Pharmacology of the Autonomic Nervous System – A lecture and seminar course dealing with adrenergic, cholinergic and peptidergic transmission in the peripheral nervous system. Topics to be discussed will include mechanisms of synthesis, storage and release of neurotransmitters and effects of drugs on these processes. Given in alternate years. Permission of instructor required.
- 545 (3) Cardiovascular Pharmacology – A course composed of lectures, assigned readings and conferences dealing with aspects of drug actions and cardiovascular function. Topics include the role of adenylate cyclase in cardiac function, the role of calcium in myocardial contractility and the effect of drugs on myocardial and vascular function. Enrolment restricted. Given in alternate years.

- 548 (2) M.Sc. Seminar – Attendance at regular seminars throughout the session and presentation of one or more papers on selected topics.
- 549 (6/12) c Master's Thesis
- 550 (2-6) c Directed Studies
- 551 (6) Pharmacy in Canada – Cultural, social, behavioural and organizational foundations and theories of pharmacy in the Canadian Health Care System. Open only to Pharmacy Administration graduate students. [3-0; 3-0]
- 552 (6) Issues in Pharmacy Administration Research – Research methods applied to the study of social and behavioural aspects of health care and pharmacy practice. Open only to pharmacy administration doctoral students who have completed graduate-level courses in statistics and research design. [3-0; 3-0]
- 554 (3) Advanced Hospital Pharmacy Management – Institutional, professional and regulatory factors that influence the planning, implementation and control of pharmacy services in hospitals. Permission of instructor required.
- 555 (3) Hospital Drug Distribution Systems – Major types of distribution systems; regulatory and professional standards that govern the manager's responsibility in the control of drug handling are explored in depth. Permission of instructor required.
- 560 (4) Radiopharmaceuticals in Nuclear Medicine – An analysis of practical and theoretical problems involved in the production and manufacture of radioactive drugs used in the diagnosis and treatment of human diseases with particular emphasis on short-lived nuclides. Quality control, B.P. and U.S.P. standards, sterility, stability, pyrogenicity, biological properties, tissue distribution, effective half life, radiation dose, health safety. The laboratory will consist of producing and quality control testing many of the radioactive drugs used in nuclear medicine. Available to senior undergraduate or graduate science, pharmacy or medical students. Limited to 10 students. Fundamental knowledge of physics, chemistry and biology is required. (Same as PATH 560.)
- 561 (2) In Vitro Assay Techniques in Nuclear Medicine – Theoretical considerations concerning qualitative and quantitative in vitro assay techniques used in nuclear medicine. These include isotope dilution, competitive protein binding, radioimmunoassay, neutron activation analysis and gamma ray spectrometry. The laboratory will consist of the performance of the above assay techniques by individual students. Available to senior undergraduate, or post-graduate science, pharmacy or medical students. Limited to 10 students. Fundamental knowledge of physics, chemistry and biology is required. (This course same as PATH 561.)
- 570 (2) Physical Assessment – Principles of and clinical experience in physical assessment of patients for monitoring of drug efficacy and toxicity; interpretation of objective patient data by the clinical pharmacist. [2-0; 0-0] or [0-0; 2-0]
- 580 (4) Toxicology I - General Principles of Toxicology. – Absorption, distribution, metabolism and excretion of toxins. Chemical mutagenesis, carcinogenesis and teratogenesis and radiation toxicology. Various subspecialties introduced include regulatory, forensic, occupational and clinical toxicology. (4-0-0; 0-0-0)
- 581 (3) Toxicology II - Target Organ Toxicology. – Action of toxins in specific organ systems, the causative agents and their mechanisms of action. The role of the toxicologist in prevention and resolution of various toxin-related problems. (0-0-0; 3-0-0)
- 582 (3) Toxicology III - Environmental Toxicology. – Toxicology and risk assessment of air, water and soil pollutants; food additives; animal and plant toxins; pesticides; heavy metals; solvents. (3-0-0; 0-0-0)
- 583 (3) Toxicology IV - Molecular Mechanisms of Toxicology. – Activation vs. detoxification by cytochromes P-450; the role of the Ah receptor; reactive oxygen species; heavy metals; apoptosis. (0-0-0; 3-0-0)
- 648 (2) Seminar for Ph.D. Students – Attendance at regular seminars throughout the session and presentation of one or more papers on selected topics.
- 649 Doctor of Philosophy Thesis

Best wishes to the Faculty, Staff and Students

**THE RICHMOND HOSPITAL
PHARMACY**

**7000 Westminster Hwy.
Richmond, B.C. V6X 1A2
(604) 244-5102 Fax: 244-5195**

**Pharmacology and Therapeutics PCTH
FACULTY OF MEDICINE**

- 300 (6) Introduction to Pharmacology – The concepts, language and techniques of scientific pharmacology. Intended primarily for Honours and Major students in Pharmacology. Prerequisites: BIOL 200 and 201; CHEM 230 or 213 or 203 and 201, 202 (or 205); permission of the Head of the Department. (Students are advised not to take this course unless their standing in the prerequisites is at least 60%) [3-3; 3-3]
- 302 (3) Introductory Pharmacology Laboratory – A series of experimental demonstrations and individual laboratory experiments illustrating the basic principles of pharmacology. Corequisite: PCTH 305. [1-3*; 1-3*]
- 305 (6) Basic Human Pharmacology – Lectures and assigned reading on the effects, mechanisms of action, absorption, distribution, fate and excretion of major classes of therapeutic agents used in humans. Indications for the use of particular drugs will be discussed in terms of risk versus benefit for the individual and for society. Corequisites: BIOC 302 and PHYL 301. [3-0; 3-0]
- 400 (6) Systematic Pharmacology – Lectures in scientific pharmacology designed to be taken in conjunction with PCTH 402. All aspects of the study of drugs will be covered, but the course will concentrate on the scientific aspects of the pharmacology of neurohumoral transmission and to a lesser extent on the pharmacology of various organs and tissues. Prerequisite: PCTH 300. [3-0-1*; 3-0-1*]
- 402 (6) Systematic Pharmacology Laboratory – A series of demonstrated, group, and individual laboratory experiments designed to illustrate the concepts and hypotheses of pharmacology. The course is restricted to Honours students in Pharmacology, but may be taken by others with permission of the Head of the Department. Prerequisite: PCTH 300. [0-9; 0-9]
- 404 (3) Drug Assay and Pharmacometrics – The techniques used to detect and measure concentrations and actions of endogenous or exogenous chemicals, using chemical assays and bioassays as appropriate. Enrolment limited to Honours students in Pharmacology and others with permission of the Head of the Department. Prerequisites: PCTH 300 and BIOL 300. [1-0; 2-0]
- 425 (8) Medical Pharmacology – A lecture and laboratory course covering the fundamental pharmacological action of drugs. Both terms.
- 448 (2-6) c Directed Studies in Pharmacology – Advanced investigation of a specific topic in Pharmacology.
- 449 (3/6) d Honours Thesis – A research problem directed by a faculty member. Restricted to Honours students.
- 451 (3) Review of Clinical Pharmacology – A lecture and seminar course dealing with selected problems in therapeutics. This course has been designed as a basic science elective for third-year medical students. Departmental approval.
- 452 (3) Medical Aspects of Nutrition – A lecture course covering essentials of nutrition as related to metabolism and disease. This course has been designed as a basic science elective for third-year medical students. Departmental approval.
- 453 (2) Therapeutics – A lecture, assigned problems, and discussion course dealing with practical aspects of therapeutics. This course is designed to give third year medical students some practical experience in the science of drug prescribing.
- 500 (3) Molecular Aspects of Drug Action at the Membrane I – Lectures, discussion and assigned reading on Receptor Kinetics; Occupancy and Rate Theories of Drug Action; Receptor Models; Approaches to Receptor Isolation; Effects of Drugs on Membrane Processes. (Given in even numbered and alternate years.)
- 501 (3) Structure-Activity Relationships of Pharmacological – Lectures, discussions and assigned reading on physicochemical approaches to drug design - the relationship between molecular structure and pharmacological activity in various representative classes of drugs. (Given in even numbered and alternate years.)
- 502 (4) Drugs and Intercellular Communication (including N – Lectures, discussions and assigned reading on the actions of drugs on the production, release, and cellular effects of hormones and neurotransmitters. (Given in odd numbered and alternate years.)
- 512 (3) Experimental Design and Bioassay – The problems of testing the efficacy of drugs in animals and humans what constitutes adequate controls and appropriate statistical analysis. (Given in odd numbered years.)
- 513 (4) 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 practice of anaesthesiology. Prerequisite: PCTH 425.
- 548 (2-6) c Directed Studies in Pharmacology – In special cases, with the approval of the Department Head, advanced courses may be arranged.
- 549 (12) M.Sc. Thesis
- 649 Ph.D. Thesis

**Philosophy
FACULTY OF ARTS**

PHIL

- 100 (6) Introduction to Philosophy – Some influential philosophical writings and doctrines, as an introduction to the problems and methods of Philosophy. Sections of this course vary; detailed descriptions are given in a booklet obtainable from the Department. [3-0; 3-0]
- 115 (6) Introduction to History and Philosophy of Science – An interdisciplinary introduction to the nature of science and technology; their place in modern culture. The course will focus on several issues, their historical development, and philosophical significance. Issues vary from year to year. (Also listed as HIST 115.)
- 120 (3) Introduction to Logic and Critical Thinking – Tools for dealing with both everyday and more technical arguments and concepts. Analysis and resolution of confusions, ambiguities, and fallacies. [3-0]
- 125 (3) Introduction to Scientific Reasoning – Practice in evaluating arguments by examining the foundations of scientific reasoning; causal models and evaluating causal hypotheses; models of decision making. [3-0]
- 210 (6) Greek Thought – A survey of Greek philosophy, science, and religion given collaboratively by members of the Departments of Classics and Philosophy. The pre-Socratics, Plato, Aristotle, Stoicism, Epicureanism. This course is recommended as preparation for PHIL 310. (Also listed as CLST 210.) [2-1; 2-1]
- 220 (3) Symbolic Logic I – Sentential and predicate logic. The development of a system of deduction based on natural deduction. Translations of natural language into a formal language. [3-0]
- 230 (3) Moral and Political Philosophy I – Theories of obligation and value; moral reasoning; normative ethics, descriptive ethics and meta-ethics. Readings in classic and contemporary texts. [3-0]

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

- 240 (3) Knowledge and Reality I – Topics in general philosophy including skepticism, theories of perception and justification, causation, induction, the mind/body problem. Readings in classic and contemporary texts. [3-0]
- 310 (3) Ancient Philosophy: A – Intensive study of a major ancient philosopher, school or movement. [3-0]
- 311 (3) Ancient Philosophy: B – For description, see PHIL 310. Prerequisite: PHIL 310. [3-0]
- 312 (3) Medieval Philosophy: A – Survey of Western European thought, in its social and cultural setting, from Augustine to the twelfth century. Topics include: the interaction of Christianity and paganism; Augustine on the nature of man; Erigena and the Carolingian renaissance; Anselm; Abelard and the twelfth century renaissance. Also listed as RELG 328. [3-0]
- 313 (3) Medieval Philosophy: B – Survey of Western European thought, in its social and cultural setting, from the twelfth to the fourteenth century. Topics include: the rediscovery of Aristotle; the influence of Islam; the rise of the universities; scholasticism: Bonaventure, Aquinas, Scotus, Ockham and after. (Also listed as RELG 329.) Prerequisite: PHIL 312. [3-0]
- 314 (3) Early Modern Philosophy: A – The development of Continental European philosophy during the seventeenth century, with emphasis on the writings of Descartes, Spinoza, and Leibniz; the influence of religion and science on the philosophical thought of the period. [3-0]
- 315 (3) Early Modern Philosophy: B – British philosophy in the seventeenth and eighteenth centuries, with emphasis on the writings of Locke, Berkeley, and Hume. Prerequisite: PHIL 314. [3-0]
- 316 (3) Modern Philosophy – Issues in nineteenth and twentieth century European philosophy. Normally available only at University College of the Cariboo. [3-0]
- 320 (3) Symbolic Logic II – The continuation of PHIL 220. A system of deduction for predicate logic is selected for further study. Completeness of this system and other metatheoretic results are proved. Prerequisite: PHIL 220. [3-0]
- 321 (3) Induction and Decision – Formal methods relevant to the logic of decision. Decision theory, game theory, axiomatic probability theory and its interpretations, belief dynamics, simulation and modelling. Prerequisite: PHIL 220. [3-0]
- 322 (3) Modal Logic – Logic of the modal operators “It is necessary that” and “It is possible that.” Possible-world semantics and a method of derivation for this logic. Prerequisite: PHIL 220. [3-0]
- 323 (3) Non-Classical Logics – One or more of conditional logic, deontic logic, epistemic logic, many-valued logic, systems of belief dynamics. Prerequisite: PHIL 220. [3-0]
- 324 (3) Philosophy of Logic – Fundamental concepts and methods of logic; the logistic method, syntax and semantics; the conditional; entailment; consequence; modal logic; problems concerning extensionality and intensionality. Frege’s distinction between sense and reference; Russell’s theory of definite descriptions; Tarski’s definition of truth. Prerequisite: PHIL 220. [3-0]
- 330 (3) Moral and Political Philosophy II – The continuation of PHIL 230. Theories of political and legal obligation and authority, legal reasoning, society and the state. Readings in classic and contemporary texts. Prerequisite: PHIL 230. [3-0]
- 337 (3) Ethical and Political Issues in Contemporary Science – Ethical, political, and other philosophical issues arising from the interaction of science/technology with social institutions. [3-0]
- 338 (3) Philosophy of Law – Concepts of law, constitution and sovereignty; law and morality; natural law theories and legal positivism; obligation, responsibility, and punishment. [3-0]
- 339 (3) Philosophy of Art – Topics include art and perception, art and reality, imagination, expression, censorship, and the role of art in human life. [3-0]
- 340 (3) Knowledge and Reality II – The continuation of PHIL 240. The nature of physical reality, substance, universals, primary and secondary qualities, theories of truth, identity through time, personal identity, free will. Readings in classic and contemporary texts. Prerequisite: PHIL 240. [3-0]
- 349 (3) Philosophy of Religion – A critical and analytical examination of arguments for and arguments against the existence of God, and other related topics. [3-0]
- 371 (6) History of Chinese Thought – The development of Chinese philosophy and ethics from their beginnings through the nineteenth century, with emphasis on Confucianism, Taoism, and Buddhism. Attention will be given both to ideas themselves and to their relationship with the cultural context. (Also listed as ASIA 325.) [3-0; 3-0]
- 372 (6) Philosophical Tradition of India – Introduction to various schools of Indian philosophy from the standpoint of analytical philosophy. Reading of (a) articles and books in English surveying the secular component in the Indian philosophical tradition, and (b) English translations of Sanskrit texts which realize the relevance of language in discussing these issues. Not given every year. (Also listed as ASIA 355.)
- 375 (3) Philosophy and Literature – Philosophical issues in works of literature or arising from theories of literary interpretation. Topics include issues relating to relativism, the nature of morality, freewill, personal identity, the nature of the emotions. [3-0]
- 390 (6/12) c Honours Tutorial – For students in third-year Honours. [0-1; 0-1]
- 400 (3) Morals, Politics and the Individual – Introduction to major themes in moral and political philosophy. Primarily for fourth-year and graduate students who have had no previous course in Philosophy. [3-0]
- 401 (3) Knowledge, Explanation, and the Nature of Things – Introduction to major themes in epistemology and metaphysics. Primarily for fourth-year and graduate students who have had no previous course in Philosophy. [3-0]
- 410 (3) Topics in Ancient Philosophy – Advanced study of the pre-socratics, or of a philosopher such as Plato, or of a school such as the Sceptics or Stoics. Topics vary from year to year. Prerequisite: PHIL 311. [3-0]
- 412 (3) Topics in Medieval Philosophy – Advanced study of a medieval philosopher such as Aquinas, or school. Prerequisite: PHIL 313. [3-0]
- 414 (3) Topics in Early Modern Philosophy – Intensive study of a major philosopher or school from Hobbes and Descartes to Hume and Reid. Prerequisite: PHIL 315 or PHIL 340. [3-0]
- 416 (3) Topics in Modern Philosophy – Study of Kant or of a major nineteenth century philosopher such as Hegel, Mill or Nietzsche, or school, such as German Idealism. Prerequisite: PHIL 315 or 340. [3-0]
- 418 (3) Topics in Twentieth-Century Philosophy – Study of a major twentieth-century philosopher or school of philosophy. Prerequisite: PHIL 340. [3-0]
- 419 (3) Philosophy of History – Concepts of history and historical explanation, historical progress, purpose, necessity, law and causation. Hegel, Marx, Vico, Spengler, Pareto, Collingwood, Croce, and Toynbee, as well as contemporary figures. Students will be expected to have an adequate knowledge of ancient or modern history. [3-0]
- 420 (3/6) d Topics in Symbolic Logic – Formal semantics, proof theory, incompleteness and decidability, axiomatic set theory, independence results. Consult the Department as to which topics are offered in a given year. Prerequisite: PHIL 220. [3-0] or [3-0; 3-0]
- 425 (3) Philosophy of Language: A – Predication, definite descriptions, performative utterances, interpretation and semantic theory. Prerequisite: PHIL 340. [3-0]
- 426 (3) Philosophy of Language: B – The continuation of PHIL 425. Prerequisite: PHIL 340. [3-0]
- 427 (3) Philosophy of Mathematics – Such questions as: would mathematics exist if there were no human beings? How does one decide whether a mathematical proposition is true? How is it that mathematics can be applied to the physical world? Readings from Frege, Russell, Hilbert, Gödel, Wittgenstein, Quine and others. [3-0]
- 428 (3) Philosophical Issues in the Foundations of Mathematics – Topics including logicism, formalism, and constructivism. An investigation of claims that mathematics can be reduced to logic, or set theory, or category theory, and of the implications of metatheorems such as those of Gödel and Church. Prerequisite: PHIL 320 or MATH 415. [3-0]
- 431 (3) Social and Political Philosophy – Central concepts and problems in political life and thought including obligation; the citizen, agent and representative; public purpose and good; justice; equality; civil rights and liberty; disobedience; the relationship between moral and legal duty and between education and politics. [3-0]
- 432 (3) Ethical Theory – Classic or contemporary works in ethical theory. Prerequisite: PHIL 330. [3-0]
- 433 (3) Bio-Medical Ethics – Moral problems arising in the health sciences, especially in medicine but also in biology, psychology, and social work. Topics include abortion, death and euthanasia, genetic engineering, behaviour modification, compulsory treatment, experimentation with human beings and animals, and the relationship between professionals and their patients, subjects or clients. No philosophical background is required. [3-0]
- 434 (3) Business and Professional Ethics – Moral problems in contemporary business and professional practice, general moral theory, the law, and policy formation. Corporate social and environmental responsibility, employee rights, preferential hiring and affirmative action programs, conflicts of interest, advertising, “whistle blowing” and self-regulation. [3-0]
- 435 (3) Environmental Ethics – Moral problems arising in the context of human relationships to nature and to non-human living things, considered both in terms of general moral theory and policy formation. Topics include moral standing, animal rights, obligations to future generations, pollution, hazardous materials, the depletion of natural resources and the treatment of non-human living things. [3-0]
- 440 (3) Epistemology – Analysis of the concept of knowledge; problems of justifying our ordinary and basic empirical beliefs. Prerequisite: PHIL 340. [3-0]
- 441 (3) Philosophy of Perception – The contribution of the senses to knowledge of the external world; problems about scepticism. Prerequisite: PHIL 340. [3-0]
- 450 (3) Metaphysics – Topics including ontology, universals and particulars, substance, determinism and indeterminism, identity over time, and theories of truth. Prerequisite: PHIL 340.
- 451 (3) Philosophy of Mind – The concepts of the mental and physical; problems of the relation between minds and bodies; problems of determining the meaning of statements about mental events. Prerequisite: PHIL 340. [3-0] [3-0]
- 452 (3) Philosophy of Action – Explanation of human actions; the conditions of responsibility; freedom of the will; the domains of rational and moral appraisal; the category of action and the individuation of actions. Prerequisite: PHIL 340. [3-0]
- 460 (3/6) d Philosophy of Science – Issues common to all sciences. Philosophical questions including the character of scientific laws, theories and revolutions, the nature of scientific confirmation, causality, explanation and prediction, and the use of logic and probability. Difficulties in the interpretation of atomic physics and questions about rela-

tionships between biology and psychology. No philosophical background is assumed. [3-0] or [3-0; 3-0]

- 461 (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]
- 462 (3/6) d Space and Time – Such topics as: Are space and time continuous? Is motion always relative to another body? Does time flow? Is time irreversible? Prerequisites: PHIL 340, or 12 credits of Mathematics or Science. [3-0] or [3-0; 3-0]
- 469 (3/6) d Topics in Philosophy of Science – Topics such as probability and induction; foundations of measurement; theory construction. Prerequisite: PHIL 460. [3-0] or [3-0; 3-0]
- 485 (3) Directed Reading – Also listed as PHIL 486-9.
- 490 (6/12) c Honours Tutorial – For students in fourth-year Honours. [0-1; 0-1]
- 510 (3-12) d Ancient Philosophy
- 512 (3-12) d Medieval Philosophy
- 514 (3-12) d Early Modern Philosophy
- 516 (3-12) d Modern Philosophy
- 518 (3-12) d Twentieth-Century Philosophy
- 520 (3-12) d Logic
- 525 (3-12) d Philosophy of Language
- 527 (3-12) d Philosophy of Mathematics
- 528 (3-12) d Philosophical Issues in the Foundations of Mathematics
- 530 (3-12) d Moral Philosophy
- 531 (3-12) d Political Philosophy
- 532 (3-12) d Ethical Theory and Practice
- 533 (3-12) d Issues in Bio-Medical Ethics
- 534 (3-12) d Issues in Business and Professional Ethics
- 535 (3-12) d Issues in Environmental Ethics
- 536 (3-12) d Ethical Issues in Public Policy
- 539 (3-12) d Aesthetics
- 540 (3-12) d Epistemology
- 550 (3-12) d Metaphysics
- 551 (3/12) d Philosophy of Mind
- 560 (3/12) d Philosophy of Science
- 581 (3) Problems – Also listed as PHIL 582-589.
- 599 (12) M.A. Thesis
- 699 Ph.D. Thesis

Physical Education **PETE**
SEE CURRICULUM STUDIES, FACULTY OF
EDUCATION

Physics **PHYS**
FACULTY OF SCIENCE

Science students with B.C. Secondary School Physics 11, but not Physics 12 are required to take six credits of Physics. Normally this requirement is met by taking PHYS 100 and 101 (or 121). Science students with Physics 12 are required to take 3 credits of Physics and this requirement is normally met by taking PHYS 101 or 121. Physics 101, 102 or 121, 122 constitute a standard first year Physics program. PHYS 100 is intended primarily for students who have completed only Physics 11 or its equivalent. Credit will not be given for PHYS 100 to students with credit for Physics 12. PHYS 101 normally requires Physics 12 or PHYS 100. Students with only Physics 11 but with a good mathematics background, after consultation with an adviser, may omit PHYS 100 and enrol in PHYS 101, but will still need to take six credits of Physics. Credit will be given for only one of PHYS 101, 121 and for only one of PHYS 102,

122. Students planning to go into Physics or Applied Science (and some other programs) are required to take PHYS 102 (122) in addition to PHYS 101 (121).
- *For students in the Faculty of Applied Science
- **Additional fees are charged for these courses. See Index "Fees - Special Fees".
- 100 (3) Introductory Physics – A course for students with a relatively weak background in Physics. An introduction to fundamental concepts such as force, energy, momentum, and the use of graphs and vectors in physics; geometrical optics; electricity; laboratory exercises to familiarize the student with both the phenomena and the basic laboratory instruments commonly used to measure them. Prerequisite: Mathematics 12; Physics 11 required for first-year students, strongly recommended for others. Students with credit for Physics 12 may not obtain credit for this course. [3-2-1; 0-0-0]
- 101 (3) Elementary Physics I – Three-dimensional kinematics and Newton's laws, conservation laws, rotational motion; simple harmonic motion, fluids, waves and sound; temperature and heat; interference and diffraction, laboratory experiments involving quantitative physics experiments with due recognition of systematic and random errors. Prerequisite: PHYS 100 or Physics 12. Corequisite: MATH 100 (120). [0-0-0; 3-3-1] or [3-3-1; 0-0-0]
- 102 (3) Elementary Physics II – Coulomb's law, electric fields, Gauss' law, electrostatic potential, capacitance, current resistance; magnetic field, Lorentz force, Ampere's and Faraday's law with applications, inductance, LC oscillations, transformers and AC circuits; quantum physics, X-rays, uncertainty principle, nuclear physics radioactivity, nuclear energy. Laboratory experiments involving quantitative physics experiments, with due recognition of systematic and random errors. Prerequisite: PHYS 101 (121). Corequisite: MATH 101 (121). [0-0-0; 3-3*-1] or [3-3*-0; 0-0-0]
- 121 (3) Physics I – An enriched course dealing mainly with simple harmonic motion and wave phenomena. Students intending to proceed in the physical sciences are encouraged to take this course. Prerequisites: an A in Physics 12 or Mathematics 12 and B or better in the other, or PHYS 100 with A standing. Corequisite: MATH 100 (120). [3-3-0; 0-0-3]
- 122 (3) Physics II – Conservation laws, angular motion rigid bodies, centripetal forces. Electricity and magnetism up to Maxwell's equations; electromagnetic waves. Intended for students planning to proceed in the physical sciences. Prerequisite: PHYS 121 or PHYS 101 with A standing. Corequisite: MATH 101 (121). [0-0-0; 3-3-0]
- 141 3 Available Energy Resources – Some physical concepts governing various forms of energy. Conservation of energy. Heat and the laws of thermodynamics. Impact of developing energy sources. Not for credit in the Faculty of Science. [3-0-1]
- 142 3 Energy Use and the Environment – Large scale energy use and its environmental consequences. The problems of nuclear power and fossil fuels and the search for alternative sources of energy. Not for credit in the Faculty of Science. Prerequisite: one of PHYS 1+1, 100 or Physics 12. [3-0-1]
- 153* (6) Elements of Physics – Thermometry, thermal properties of matter, heat, oscillations, waves, sound, wave optics. Geometrical optics, elementary electricity and magnetism, simple d.c. and a.c. circuits. Prerequisite: Physics 12. Credit will be given for only one of PHYS 153 and 101/102 or 121/122. [3-0-1; 3-3-1]
- 157 2 Heat and Thermodynamics – Thermometry; thermal properties of matter; heat transfer by conduction, convection and radiation; kinetic theory of gases and gas laws; heat engines; refrigeration; change of state; first and second laws of thermodynamics. Prerequisites: one of PHYS 153, 110, 115, 120, 101, 121, and MATH 101 or 154. [2-0-1; 0-0-3]

- 159* (1) Experimental Techniques – Basic experimental techniques in acquisition, analysis, and presentation of data. Prerequisites: one of PHYS 153, 110, 115, 120, 121, 101 and MATH 101 or 154. [1-3*-0; 0-0-0]
- 170* (3) Mechanics I – Statics of particles, equilibrium of rigid bodies, rigid body statics and internal forces; kinematics: rectilinear motion; dynamics: Newton's 2nd law, friction, impulse, momentum, work and energy. Emphasis is placed throughout on the analysis of practical mechanics problems using freebody diagram techniques. Prerequisite: Physics 12 or PHYS 100. Not for credit in the Faculty of Science. [3-0-1; 0-0-0] or [0-0-0; 3-0-1]
- 200 (3) Relativity and Quanta – Special relativity: Lorentz transformation, dynamics and conservation laws. Quantum physics: the experimental evidence for quantization; a qualitative discussion of the concepts of quantum mechanics and their application to simple systems of atoms and nuclei. Prerequisites: MATH 101, one of PHYS 110, 115, 120, 102, or 122. [3-0-1; 0-0-0]
- 203 (3) Thermal Physics I – Laws of thermodynamics. Thermodynamic potentials. Applications to homogeneous and inhomogeneous equilibrium systems with particular reference to electric and magnetic systems. Non-equilibrium systems. Intended for Honours students. Prerequisites: at least 68% in one of PHYS 110, 115, 120, 102 or 122, or permission from the Head. Corequisite: MATH 200. [2-3-1; 0-0-0] or [0-0-0; 2-3-1]
- 206 (3) Mechanics – Selected topics in classical mechanics including Kepler's problem, non-inertial reference frames and Lagrange's equation of motion. Intended for Honours students. Prerequisites: MATH 200 and 221, at least 68% in one of PHYS 120, 122 or 102, or PHYS 216, or permission from the Head. [0-0-0; 3-0-1]
- 209 (3) Intermediate Experimental Physics – The response of RLC circuits to sinusoidal and transient signals; an introduction to digital electronics. Intended for Honours students. Prerequisites: at least 68% in one of PHYS 110, 115, 120, 122 or 102, or permission from the Head. Corequisite: MATH 200 and 221. [2-3-0; 0-0-0]
- 211 (3) Modern Laboratory Practice – Topics include: computational techniques for data acquisition, data analysis, report preparation, simulation of experiments, and networking larger systems. Prerequisites: MATH 101, one of PHYS 110, 115, 120, 101 or 121. Corequisites: PHYS 102, MATH 200 and 221. [2-3-1; 0-0-0]
- 213 (3) Thermodynamics – The laws of thermodynamics, thermodynamic potentials, phase changes, kinetic theory of gases, thermal properties of matter, elementary statistical physics. Prerequisites: one of PHYS 110, 115, 120, 101 or 121; MATH 101. Corequisite: MATH 200 (fall term) [3-0-1; 0-0-0]
- 215 (3) Electricity – AC circuits, steady-state and transient response, resonant circuits, complex vector representation of sinusoidal quantities. Experiments in voltage current and impedance measurements; RC, RL, and RCL circuits, coupled oscillators. Prerequisites: one of PHYS 110, 115, 120, 102 or 122, MATH 200, 221. [0-0-0; 2-3-1]
- 216 (3) Mechanics – Review of kinematics, Newton's laws, angular momentum and fixed axis rotation. Rigid body motion, central forces, non-inertial frames of reference. Prerequisites: MATH 200, 221, one of PHYS 110, 115, 120, 101 or 121. [0-0-0; 3-0-1]
- 230 (3) Twentieth-Century Physics – Topics will include quantum physics, nuclear energy and particle physics at a level suitable for science students not proceeding to a physics degree. Prerequisites: MATH 100 and one of PHYS 110, 115, 120, 101 or 121. Not for credit towards a B.Sc. degree in Physics. [3-0-0; 0-0-0]
- 250* (4) Introduction to Modern Physics – Wave particles, duality of matter, special relativity, processes in atomic, nuclear and solid state and introduction to quantum mechanical measurement devices and techniques. Prerequisite: one of PHYS 115, 120, 102, 122 or 153. [0-0-0; 3-3-1]

- 251* (4) Electric and Magnetic Fields – Electric and magnetic fields, with applications; Maxwell's equations. Prerequisites: one of PHYS 110, 115, 120, 102, 122 or 153. [3-3-1; 0-0-0]
- 270* (5) Mechanics II – Statics: distributed loads, centroids, moments of inertia; dynamics: systems of particles, kinematics and kinetics of rigid bodies (plane motion), D'Alembert's Principle, energy and momentum methods. Prerequisite: PHYS 170. [3-0-1; 0-0-0] or [0-0-0; 3-0-1]
- 298** (0) Co-operative Work Placement I – Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Normally taken during the winter term of the second year. Technical report required. Restricted to students admitted to the Co-operative Education in Physics. Prerequisites: PHYS 200, 203.
- 299** (0) Co-operative Work Placement II – Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Normally taken during the summer following the second year. Technical report required. Restricted to students admitted to the Co-operative Education in Physics. Prerequisite: PHYS 298.
- 301 (3) Electricity and Magnetism – Electrical fields and potentials of static charge distributions, current, fields of moving charges, magnetic field, electromagnetic induction, Maxwell's equations. Intended for third-year Honours students. MATH 317 is a strongly recommended corequisite. [3-0-1; 0-0-0]
- 303 (3) Thermal Physics II – Ensemble theory, application to classical and quantum gases. Boltzmann equation. Intended for Honours students. Prerequisites: PHYS 203, MATH 200. [3-0-0; 0-0-0]
- 304 (3) Introduction to Quantum Mechanics – The beginnings of quantum mechanics, wave mechanics and the Schroedinger equation, one dimensional potentials, the postulates of quantum mechanics, applications to three dimensional systems. Prerequisite: MATH 215, PHYS 200. [0-0; 3-0]
- 305 (3) Introduction to Biophysics – An introduction for physicists (assumed to have no background in biology) to the basics of molecular biology, followed by selected examples where insights from physics and mathematics have helped solve important biological problems. Intended for students with 3rd or 4th year standing in physics. Not for credit for Life Sciences students. Prerequisite: MATH 215. [3-0-0; 0-0-0]
- 306 (3) Theoretical Mechanics – Analytical mechanics of particles and rigid bodies. Lagrangians and Hamiltonians, Hamilton-Jacobi theory. Intended for Honours students. Prerequisite: PHYS 206. [0-0-0; 3-0-0]
- 307 (2) Optics Laboratory – Selected experiments in optics. Corequisite: PHYS 308. [0-3-0; 0-3-0] or [0-0-0; 0-6-0]
- 308 (3) Optics – Physical optics: polarization, Fresnel equation coherence, interference, diffraction, lasers, holography, Fourier optics. Prerequisite: PHYS 301 or 311. [0-0-0; 2-3-0]
- 309 (6) Honours Electrical Laboratory – Selected experiments in electricity, magnetism and electronics for Honours students. Prerequisite: PHYS 209 or PHYS 215 or equivalent. [2-4-1*; 0-4-1*]
- 311 (3) Electricity and Magnetism – Properties of the electromagnetic field using the concepts of divergence, gradient and curl; dielectric and magnetic materials; Maxwell's Equations and applications. Prerequisites: MATH 317, and PHYS 102 or 122 or GEOP 230. [0-0-0; 3-0-1]
- 312 (3) Introduction to Mathematical Physics – The application of ordinary and partial differential equations to physical problems; boundary and initial value problems associated with heat, wave and Laplace equations. Fourier analysis; expansions in Bessel and Legendre functions. Prerequisite: MATH 215. Credit will be given for only one of PHYS 312 and MATH 316. [0-0-0; 3-0-0]
- 314 (3) Fluids – Kinetic theory: Diffusion, viscosity and sound waves. Introduction to hydrodynamics: Laminar flow, capillary and gravity waves, convection and turbulence. Dimensional analysis. Prerequisite: PHYS 203 or 213 or CHEM 201 or 205. Corequisite: MATH 215. [3-0-0; 0-0-0]
- 315 (3) Physics of Materials – Crystal structure, elasticity and phonons, elementary electronic transport, defects, alloys, liquid crystals and polymers. Prerequisite: PHYS 203 or 213 or CHEM 201 or 205. Corequisite: MATH 215. [0-0-0; 3-0-0]
- 317 (3) Light – Radiation, photometry, illumination, colour, geometrical optics. Prerequisites: PHYS 102 or 122, and MATH 221. [3-3*-0; 0-0-0] or [0-0-0; 3-3*-0]
- 318 (3) Acoustics – Acoustic oscillators (including loudspeakers), acoustic waves, and architectural acoustics. Prerequisite: PHYS 209 or 215. [0-0-0; 3-3*-0] or [3-3*-0; 0-0-0]
- 319 (3) Electrical Laboratory – Selected experiments in electromagnetism; computer data acquisition and control; amplification and feedback; operational amplifiers; digital logic. Corequisite: PHYS 211. Prerequisite: PHYS 215 or 209. [0-4-1*; 0-4-1*]
- 340 (6) Elements of Physics – A survey of the conceptual framework of physics for non-scientists who wish to master new paradigms and imagery. Mathematical language and problem-solving are de-emphasized. Topics include: classical laws of motion, gravitation, electromagnetism, relativity, quantum mechanics, elementary particles and "current events" in physics. Prerequisite: full standing in the Second or higher Year. Not for credit in the Faculties of Science or Applied Science. [3-0-0; 3-0-0]
- 341 (3) Physics of Music – An introduction to the physical principles important to the production, transmission and perception of musical sounds. The treatment will be non-mathematical; with emphasis on demonstrations. Topics may include the description of sound waves, resonances, scales, physics of hearing, examination of specific musical instruments, etc. Not for credit in the Faculties of Science and Applied Science. [0-0-0; 3-0-0]
- 349 (2-6) c Directed Studies – With approval of the Head of the Physics Department, studies under the direction of a staff member may be arranged. Intended for Honours and Major physics students.
- 350* (2) Quantum Mechanics I – Postulates of Quantum Mechanics, Schroedinger equation, Dirac notation, barrier and tunnelling phenomena, the hydrogen atom. [0-0-0; 2-0-0]
- 351* (3) Applied Electromagnetic Theory – Maxwell's equations, magnetic materials, wave guides, radiation and antennae. Prerequisite: PHYS 251. [3-0-0; 0-0-0]
- 352* (2) Laboratory Techniques in Physics – Must be taken concurrently with PHYS 351. Some of the experiments will be based on the lecture material for PHYS 351. Other techniques and subjects will be covered. [0-3-0; 0-0-0]
- 353* (3) Introduction to Atomic Physics – Electrons, photoelectric effect, Compton effect, the Bohr atom, X-rays, Zeeman effect, De Broglie, Schroedinger equation, the hydrogen atom, electron spin and spectroscopy. Primarily for Electrical Engineering students. [3-0-0; 0-0-0]
- 398* (2) Technical Report – A technical report preferably based on summer work and at least 2000 words long to be submitted to the Department by November 15.
- 399** (0) Co-operative Work Placement III – Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Normally taken during the summer following the third year. Technical report required. Restricted to students admitted to the Co-operative Education in Physics. Prerequisite: PHYS 299.
- 400 (3) Introduction to Elementary Particle Physics – Classification of elementary particles and the forces of nature. A discussion of the most important models, i.e. quarks and symmetry groups. Prerequisite: PHYS 304 or corequisite PHYS 412. [3-0-0; 0-0-0]
- 401 (3) Electromagnetic Theory – The application of Maxwell's Theory to the propagation of electromagnetic waves. Prerequisite: PHYS 301. [0-0; 3-0]
- 402 (3) Applications of Quantum Mechanics – Spin and angular momentum addition, perturbation methods, and applications in the fields of Atomic, Molecular, Nuclear, and Solid State Physics. Prerequisite: PHYS 304. [3-0; 0-0]
- 403 (3) Statistical Physics – Laws of thermodynamics and statistical mechanics; applications to modern physics. Prerequisite: PHYS 303. [3-0-0; 0-0-0]
- 404 (3) Physical Techniques in Diagnostic Medicine – The emphasis is put on the physical principles involved and technical aspects of the interpretations. Magnetic resonance imaging, nuclear medicine, ultrasound, computed tomography and optical microscopy. Prerequisite: third- or fourth-year standing in science. [3-0-0; 0-0-0]
- 405 (3) Radiation Biophysics – Physical and chemical interactions of ionizing radiations and their biological effects at the cellular, tissue and whole animal levels. Topics in radiation dosimetry, radiation protection, radiation carcinogenesis, and the treatment of malignant disease in humans will be included. Prerequisite: Third- or Fourth-Year standing in Science, or permission of the Head of the Department. Credit will be given for only one of PHYS 405 and 436. [0-0-0; 3-0-0]
- 406 (3) Continuum Mechanics – Mechanics of deformable bodies; equations of motion; stress and strain tensors. Basic concepts for solids and liquids with elements of nonlinear mechanics applicable to macromolecular structures such as polymeric materials and biological tissues. Prerequisite: PHYS 206 or 216 and MATH 316 or PHYS 312. Credit may be obtained for only one of PHYS 406 and GEOP 320. [3-0-0; 0-0-0]
- 408 (2) Fluid Flow – Subsonic flow of viscous and non-viscous fluids. Boundary layers. Laminar and turbulent flow. Supersonic flow and shock waves, cavitation and capillarity. Prerequisite: PHYS 306. [0-0-0; 2-0-0]
- 409 (2-6) c Experimental Physics – A laboratory course with a wide choice of experiments for fourth year Honours and Major students. Topics include solid state, nuclear, classical, quantum, electromagnetic and low temperature physics. For 6 credits, two weekly laboratory periods and completion of a project in second term are required. Prerequisite: PHYS 309 or 319. [0-6-0; 0-6-0]
- 411 (3) Electrodynamics – Maxwell's equations with emphasis on applications to guided waves, antennas, superconductivity, plasmas and other electromagnetic phenomena of current interest. Prerequisite: PHYS 301 or 311. [0-0-0; 3-0-0]
- 412 (3) Atomic Physics – The major phenomena in the fields of atomic physics. Prerequisite: PHYS 200 and MATH 215. [3-0-0; 0-0-0]
- 414 (3) Radioactivity and Nuclear Physics – A survey of basic concepts of nuclear physics with applications in power, medicine, geology, industry, archaeology, cosmology. Prerequisites: PHYS 200 and 311; MATH 215. [0-0-0; 3-0-0]
- 420 (2-4) c Physics Demonstrations – The students will prepare, under the supervision of a faculty member, a demonstration or series of demonstrations intended to illustrate physical principles to diverse audiences. Intended for 3rd or 4th year Physics Majors and Math/Science Education students. Prerequisite: permission of the Head of the Physics Department
- 421 (3) Physics of the Atmosphere – Application of fluid dynamics and thermodynamics to medium and large scale atmospheric phenomena. Topics include general circulation, atmospheric waves and instabilities, turbulence, numerical modelling and satellite remote-sensing. Prerequisite: PHYS 203 or 213; corequisite MATH 215. [3-0-0; 0-0-0]
- 436 (3) Health Physics Measurement and Control – Biological effects of the physical and chemical interactions of gamma-ray, ultraviolet, infrared and microwave radiation. Instrumentation for monitoring of radiation, accident preven-

- tion and control strategy. This course includes both lecture and laboratory components. Prerequisites: Third or Fourth Year standing in Science or permission of the Director of the Occupational Hygiene Program. Credit will be given for only one of PHYS 405 and 436. [0-0-0; 3-2*-0]
- 438 (3) Zoological Physics -- Animal systems viewed from a physicist's perspective. Topics include sensory systems, energy budgets, locomotion, internal flows, physical advantages of grouping. Prerequisite: PHYS 101 or 121 or equivalent, BIOL 325 is recommended. Not for credit towards a B.Sc. in physics. [0-0-0; 3-0-0]
- 449 (6) Honours Thesis -- A research project, undertaken under the direction of a faculty member culminating in a thesis. [0-6-1*, 0-6-1*]
- 452* (3) Quantum Mechanics -- Spin angular momentum, Pauli spin matrices; addition of angular momenta; spin-orbit interaction; perturbation theory; Zeeman, Stark effects, optical transitions, magnetic resonance and other applications: multielectron atoms; Hartree Fock; molecules; symmetries. Prerequisite: PHYS 250. [3-0-0; 0-0-0]
- 455* (3) Statistical Mechanics -- Introduction to quantum statistical mechanics and its application to systems of varying complexity from the simple ideal gas to the degenerate gas. Prerequisite: PHYS 157. [0-0-0; 3-0-0]
- 456* (3) Applications of Classical Mechanics -- Review of principles. Particle mechanics: planetary motion, perturbation theory. Rigid body mechanics: Euler's equations, tops and gyroscopes, motion of the Earth. Lagrangian and Hamiltonian methods. Variational principles in optics and mechanics. Liouville's theorem and statistical mechanics. The relationship between classical and quantum mechanics. Prerequisite: PHYS 270. [3-0-0; 0-0-0]
- 458* (4) Applied Optics -- Basic applications of lasers, geometrical optics, fibre optics, diffraction; and Fourier optics. Prerequisite: PHYS 250, 251. [1-3*-0; 2-3*-0]
- 473* (3) Applied Nuclear Physics -- Radioactive decay and radiations, nuclear properties, interactions of neutrons, physical principles of power reactors, nuclear fusion, radiation monitoring and safety. Prerequisite: PHYS 250, 452. [3-0-1*, 0-0-0]
- 474* (3) Applied Solid State Physics -- Symmetry of crystal structures, waves in lattices, band theory, statistics, effective mass approximation, electrical conduction in metals and semiconductors, superconductivity and applications. Prerequisite: PHYS 250, 452. [0-0-0; 3-0-0]
- 475* (3) Introduction to Statistical Mechanics -- Review of thermodynamics, fundamentals of statistical mechanics and its relation to classical thermodynamics; applications to thermal, magnetic and electrical properties of matter. Primarily for Electrical Engineering students. [0-0-0; 3-0-0]
- 477* (3) Applied Plasma Physics -- Introductory treatment, with emphasis on applications. Properties of equilibrium plasmas. Measurement techniques. Astrophysical plasmas. Laboratory devices, including gaseous lasers. Thermo-nuclear fusion. Prerequisite: PHYS 250. [0-0-0; 3-0-0]
- 498** (0) Co-operative Work Placement IV -- Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Normally taken during the fall term of the fourth year. Technical report required. Restricted to students admitted to the Co-operative Education in Physics. Prerequisite: PHYS 399.
- 499** (0) Co-operative Work Placement V -- Approved and supervised technical work experience in an industrial research setting for a minimum of 3.5 months. Normally taken during the summer following the fourth year. Technical report required. Restricted to students admitted to the Co-operative Education in Physics. Prerequisite: PHYS 498.
- 500 (3/6) c Quantum Mechanics -- Non-relativistic quantum mechanics with applications to atomic, nuclear and particle physics. Elementary field-theory techniques for many-body systems. The Dirac equation. Introduction to the quantum field theory of electrons and photons. Prerequisite: one of PHYS 402 or 452.
- 502 (3) Condensed Matter Physics I -- One-electron theory of solids, energy bands, lattice vibration, transport theory.
- 503 (3) Condensed Matter Physics II -- Interacting electrons, electron-phonon interaction, Hubbard model, magnetism, superconductivity, use of Green functions. Prerequisite: PHYS 502. Corequisite: PHYS 500.
- 504 (3) Relativity and Electromagnetism -- A review of special relativity, and a presentation of classical electromagnetism as a relativistic field theory. Radiation from moving charges, classical electron theory, Wheeler Feynman electrodynamics. Prerequisite: PHYS 401.
- 505 (4) Nuclei and Particles -- General properties of the nucleus, two-body problem at low energies, nuclear forces, nuclear models, nuclear reactions, interaction of nuclei with electromagnetic radiation, beta-decay. Properties of elementary particles, classification of interactions, intermediate and high energy reactions.
- 507 (4) Plasma Physics -- Equilibrium theory of ionized gases, kinetic theory, transport coefficients. Motion of individual charges, cyclotron radiation. Waves, Landau damping, Derivation of magnetohydrodynamic equations.
- 508 (4/6) c Quantum Field Theory -- Feynman diagrams and renormalization; quantum electrodynamics; calculation of fundamental processes; non-abelian gauge theories. Prerequisite: PHYS 500.
- 509 (2-3) d Theory of Measurements -- Estimation of parameters from experimental measurements; maximum likelihood; least squares; tests of significance (chi square, etc.). Noise properties of common devices. Extracting signals from noise; signal averaging; auto and cross-correlation, etc.
- 510 (2-3) d 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 (2-3) d Special Topics in Magnetism -- Spin Hamiltonian, theory of ferro- and antiferromagnetism, nuclear magnetic resonance, relaxation in spin systems. Prerequisite: PHYS 503.
- 512 (2-3) d Vibrational Spectroscopy of Solids -- Symmetry of vibrations of isolated molecules; calculation of normal modes; vibrations of molecular crystals, optical properties of solids.
- 513 (2-4) d Topics in Advanced Spectroscopy
- 514 (2-4) d Classical Field Theory -- Classical field theory in flat space-time. Variational principles and conservation laws. Tensor fields and manifolds. The course is a preparation for study of relativistic gravitation and quantum field theory. Prerequisite: PHYS 504.
- 515 (2-4) d Neural Networks -- Perceptrons; the XOR problem; hidden units; back propagation; generalized delta rule; content addressable memories (Hopfield model); extended Hopfield model; travelling salesman problem; model based on neurons that exhibit hysteresis; application of Liap
- 516 (3) Statistical Mechanics -- Mean field theory, Landau theory of phase transitions, critical phenomena, renormalization theory, Monte Carlo method, linear response theory, fluctuations.
- 517 (2) Introduction to Low Temperature Physics -- Cryogenic techniques and instrumentation. Some aspects of superconductors and liquid helium.
- 518 (2) Superconductivity -- Conventional theories: BCS and Landau-Ginsburg, Josephson effect. New theories of high TC superconductivity.
- 519 (2) Surface Physics -- Structure and electronic properties of solid surfaces, optical properties, adsorption phenomena, surface analysis, epitaxy.
- 521 (2-4) c Group Theory Methods in Quantum Mechanics -- Selected topics from atomic, molecular, solid state, nuclear and elementary particle physics treated by group theory methods. Prerequisite: PHYS 500.
- 522 (4) Intermediate Energy Nuclear Physics -- Selected topics in low and intermediate energy nuclear physics. Prerequisites: PHYS 508 (may be taken concurrently), 505.
- 523 (2-3) d Quantum Electronics and Nonlinear Optics -- Macroscopic and microscopic treatments of linear and non-linear response to electromagnetic fields.
- 524 (4) Non-equilibrium Thermodynamics -- Recent developments in thermodynamics, with special emphasis on the stability of systems far from equilibrium.
- 525 (2-3) d Advanced Condensed Matter Physics -- Current issues in condensed matter theory. Prerequisites: PHYS 500 and PHYS 503.
- 527 (2) Theoretical Nuclear Physics -- Selected topics from current nuclear theory. Prerequisites: PHYS 501, 505.
- 528 (2/4) c Elementary Particle Physics -- Selected topics in high energy physics. Prerequisites: PHYS 508 (may be taken concurrently), 505.
- 529 (2/4) c Advanced Quantum Mechanics -- Selected topics in relativistic quantum mechanics, quantum field theory, and theories of elementary particles. Prerequisites will depend on the topics to be discussed. Permission of the Head of the Department must be obtained.
- 530 (2-4) d Topics in General Relativity Theory Prerequisite: PHYS 514.
- 532 (4) Plasma Dynamics -- The magnetohydrodynamic formulation of plasma dynamics including the effects of diffusion, viscosity, thermal conduction and ionization phenomena on plasma motion.
- 533 (2) Laser Physics -- Interaction of EM-radiation with matter, Gaussian beams and optical resonators, laser oscillators, specific laser systems, amplification in laser media, the electro-optic effect.
- 534 (4) Radiological Physics I -- Principles of dosimetry of ionizing radiation with emphasis on applications to radiotherapy and radiobiology.
- 535 (4) Radiological Physics II -- A continuation of PHYS 534, including an extension of the topics discussed in that course.
- 536 (2) Advanced Radiation Biophysics -- Interactions of radiation with matter in living cells. Description of events following ionizing irradiation; cell survival as a function of dose; survival models. Students will be expected to present a seminar on a pre-selected topic, and participate in c
- 537 (3) Physics of Soft Organic Interfaces -- Interactions in liquids, free liquid interfaces, surfactant assemblies, membranes of biological organisms, emphasizing the relation of chemical characteristics to structure and physical properties. Prerequisites: PHYS 303 or CHEM 304.
- 538 (3) Physical Properties of Synthetic and Natural Members -- Permeability and surface diffusion, electrical and chemical potentials, mechanical and strength properties, colloidal interactions and adhesion, material stability and coalescence, technological applications. Prerequisite: PHYS 537.
- 549 (12) Master's Thesis
- 555 (2-6) c 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.
- 570 (2-4) c Radio Astronomy -- Emission, propagation and detection of radio noise from the solar system, galaxy and extragalactic radio sources.
- 571 (2) Cosmic Physics -- Reviews of radio, infra-red, optical, ultra-violet, X-ray, gamma ray and particle astronomy. Studies of interstellar matter. Developments in theories of gravitation and cosmology.
- 599* Thesis For M.Sc. Thesis
- 649 Ph.D. Thesis

Physiology**FACULTY OF MEDICINE**

MATH 100 and 101 (or 120 and 121) and PHYS 101 and any other PHYS course that is for credit in the Faculty of Science are prerequisite to all courses in Physiology. In the Honours program the required second year courses, BIOL 200, 201, CHEM 205, or 201 and 202, 213 or 203, MATH 200 and MICB 200 must normally be completed prior to entry into third year.

- 301 (6) Human Physiology – A lecture course on body function with particular reference to mammalian and human physiology. Credit will normally be given for only one of the following: PHYL 301 and 303 or BIOL 353. Prerequisites: BIOL 101 or 102 or 103 and CHEM 213 or 203 or 230. [3-0; 3-0]
- 302 (3) Human Physiology Laboratory – A laboratory course designed to illustrate physiological principles and to provide training in physiological techniques. Must be taken in conjunction with PHYL 301. Enrolment limited. Available only to students in the Faculty of Pharmaceutical Sciences. [0-3; 0-3]
- 303 (3) Laboratory in Human Physiology (Honours) – Techniques and principles of human physiology. This course must be taken in conjunction with PHYL 301. Restricted to Physiology and Pharmacology Honours students. [0-3; 0-3]
- 400 (13) Human Physiology – A lecture and laboratory course on body function with particular reference to human physiology. The functions of muscle, nerve, metabolism, circulation, respiration, excretion, digestion, and the endocrines are dealt with. Enrolment limited to Medical and Dental students.
- 422 (3) Mammalian Cardiovascular and Respiratory Physiology – The control and integration of cardio-pulmonary function in mammals. Intended for Honours students in Physiology or other Life Sciences. Prerequisite: PHYL 301 and permission of the Head of the Department. [3-0; 0-0]
- 423 (3) Mammalian Renal and Gastrointestinal Physiology – Control of mammalian renal and gastrointestinal systems. Role in homeostasis. Intended for Honours students in Physiology or other Life Sciences. Prerequisite: PHYL 301 and permission of the Head of the Department. [3-0; 0-0]
- 424 (3) Mammalian Endocrinology – Hormonal control of homeostatic, metabolic and reproductive function. Intended for Honours students in Physiology or other Life Sciences. Prerequisite: PHYL 301 and permission of the Head of the Department. [0-0; 3-0]
- 425 (2) Elements of Neurophysiology – An introduction to the functions of the nervous system. ANAT 425 must be taken concurrently. [2-3; 0-0]
- 426 (3) Physiological Basis of Central Nervous System Functions – An integrated study of the structural and functional organization of the central nervous system with special emphasis on neurophysiological mechanisms. Prerequisite: PHYL 301 (or equivalent). [0-0; 3-0]
- 430 (6) Advanced Laboratory in Physiology – A laboratory course giving training in the methods, techniques and use of instruments required for physiological investigation. (PHYL 303 and the consent of the Department are required and enrolment will be limited.) [0-6; 0-6]
- 448 (2-6) c Directed Studies in Physiology
- 449 (6) 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.
- 453 (3) Topics in Human Physiology – Students will study a selected topic under the supervision of a Faculty member. Topics will usually be areas of current interest in applied physiology. This course is designed as a basic science elective for third year medical students. Departmental approval is required.

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- 511 (2-6) c Seminar in Mammalian Physiology
- 521 (3) Advanced Topics in Renal Physiology
- 522 (3) Advanced Topics in Cardiovascular Physiology
- 523 (3) Advanced Topics in Gastrointestinal Physiology
- 524 (3) Advanced Topics in Endocrinology
- 526 (3) Advanced Topics in Neurophysiology
- 527 (3) Advanced Topics in Respiratory Physiology
- 530 (3) Muscle Biophysics – (Same as ANAT 527.)
- 531 (3) Sensory Physiology I: Hearing and Vision – Offered in even numbered years. Prerequisite: PHYL 425 or equivalent.
- 532 (3) Sensory Physiology II: Vestibular System, Somatic – Offered in odd numbered years. Prerequisite: PHYL 425 or equivalent.
- 533 (3) Physiology of Thermoregulation – Comprehensive study of thermoregulatory physiology and pathophysiology from molecular to organismal levels in mammal and other vertebrates.
- 548 (2-6) c Advanced Topics in Human Physiology
- 549 (12) M.Sc. Thesis
- 649 Ph.D. Thesis

Plant Science**FACULTY OF AGRICULTURAL SCIENCES**

- BIOL 101, 102 or 103 is a prerequisite for all Plant Science courses except PLNT 259, 315, 316, 321, 322 and 410. PLNT 259 is normally an additional prerequisite for all 300 and 400 level courses except PLNT 315, 316, 321, 322 and 410.
- 258 (3) Introduction to Seed Plant Taxonomy – Introduction to seed plant taxonomy emphasizing descriptive morphology and identification. Each student will be required to submit a plant collection. (Same as BIOL 324.) [2-3; 0-0]
- 259 (3) Introduction to Plant Science – Introduction to the growth, development and utilization of cultivated plants. Influences of climate, soil, weeds, diseases and pests; cultural practices and systems; plant improvement. [0-0; 3-2]
- 304 (3) Introduction to Range Management – Ecology and management of rangeland. [0-0; 2-2]
- 315 (3) Herbaceous Plants in the Landscape – Culture and identification of herbaceous plant materials and their use in the landscape. (Suitable for students of other faculties and departments interested in landscape materials and their uses.) (Offered in alternate years.) [2-2; 0-0]
- 316 (3) Trees and Shrubs in the Landscape I – Culture and identification of landscape materials with emphasis on woody plants. Elementary principles of landscape composition. (Suitable for students of other faculties and departments interested in landscape materials and their uses, but priority given to Plant Science and B.L.A. students.) [0-0; 2-2]
- 320 (3) Field Studies and Practices in Agronomy, Horticulture, Crop Protection or Range Science – Summer field work under the direction of an approved plant scientist, supported by a report relative to some phase of the field operation. Permission of the Head of the Department.
- 321 (3) Biometrics – Elementary principles of the analysis, presentation and interpretation of biological data. Prerequisite: First year Mathematics. [3-2; 0-0]
- 322 (3) Design of Experiments – Practical problems and discussion of experimental design and interpretation. Prerequisite: PLNT 321 or equivalent. [0-0; 3-2]
- 324 (3) Plant Physiology I – Mechanisms and regulation of functional processes contributing to the assimilation, transport and utilization of water, mineral nutrients and carbon by plants. Same as BIOL 351 and FRST 311. [3-2; 0-0]
- 335 (3) Plant-Microbe Interactions – Introduction to the ecology and physiology of the interactions between plants

PLNT

- and microbes. Prerequisites: BIOL 201. [3-2; 0-0]
- 336 (3) Introductory Plant Pathology – Study of the ecology of plant pathogenic organisms; principles of disease development and control.
- 338 (3) Weed Science – Importance, identification, dissemination and biology of weeds; preventive, cultural, biological and chemical methods of control. [0-0; 3-2]
- 331 (3) Economic Entomology – Identification, morphology, development and ecology of insects; insect-plant relations. Modern methods of controlling insect pests; integrated pest management and related concepts. A collection of 70 species of insects is required. Credit will not be given for both PLNT 331 and BIOL 327. [3-2; 0-0]
- 401 (3) Field Studies in Rangeland Resources – Applications of rangeland management techniques and principles. Offered between third and fourth years. Prerequisite: PLNT 304. Enrolment limited. A fee may be charged. [3-2; 0-0]
- 404 (3) Ecology and Management of North American Range Plant Communities – Distribution, floristics, succession and management of North American steppe communities, with particular emphasis on integrated management of grazing ecosystems in British Columbia. [3-2; 0-0]
- 408 (3) Agronomy – Management, production, conservation of agronomic crops. Emphasis is on agronomic crops used primarily for forage. Principles of production of food, oil and fibre crops, seed production technology and the use of agronomic and native species in revegetation and reforestation are also included. (Offered in alternate years.) [3-2; 0-0]
- 409 (3) Turf Management – Selection, cultivation and management of specialized grasses and other ground covers for use in residential and commercial landscaping, recreational and sports turf, golf courses, road sides and selected applications. (Offered in alternate years.) [0-0; 3-0-2]
- 410 (3) Nursery Production – Principles and practices of propagation, culture and protection of woody and herbaceous plants, with emphasis on the production and management of nursery stock. (Offered in alternate years.) [0-0; 3-2]
- 411 (3) Temperate Zone Fruit Production – An integrated approach to technical and practical aspects of the production and protection of berry and tree fruit crops. Cultivars, propagation, management, pruning, and harvesting. Identification and control of weeds, pests and diseases. (Offered in alternate years.) Co- or prerequisites: PLNT 331, 336, 338.
- 413 (3) Plant Breeding and Biotechnology – Genetic basis and methodology of breeding for improved crop and ornamental plants. Application of tissue culture and molecular biology to plant improvement. Prerequisite: AGSC 213 and BIOL 201. (Offered in alternate years.) [0-0; 3-2]
- 415 (3) Structure, Form and Adaptability in Planting Design – Lectures and exercises dealing with plants as structural elements in landscape. Plant associations. Horticultural adaptations. Planning in relation to subsequent maintenance. Prerequisite: PLNT 316. [2-2; 0-0]
- 417 (3) Vegetable Crops – Principles and practices of vegetable crop production; emphasis on morphology, growth processes, production, protection, harvesting, quality and composition. (Offered in alternate years.) [3-2; 0-0]
- 418 (3) Greenhouse Crop Production – Principles and practices of flower and vegetable crop production and protection in greenhouse controlled environment systems. (Offered in alternate years.) [0-0; 3-2]
- 423 (2) Undergraduate Seminar
- 424 (3) Crop Physiology – Physiological processes and their integration during crop growth and development. Control of crop yield by environmental conditions and chemical growth regulators. (Offered in alternate years.) Prerequisite: PLNT 324. [0-0; 3-2]
- 430 (2-6) c Directed Studies

- 431 (3) Insect Ecology – Behavioural, population and community ecology of insects. Interaction between insects and plants and the application of the principles of insect ecology to biological control of insects and weeds. Prerequisites: BIOL 205 or PLNT 331. (Same as BIOL 411.) [3-0; 0-0]
- 432 (3) Insect Physiology – Physiology of insect growth and development with emphasis on insects of economic importance; physiological basis of insect control. Prerequisite: PLNT 331 or BIOL 327. Same as BIOL 457. (Offered in alternate years.) [0-0; 3-1]
- 433 (3) Integrated Pest Management – Development and implementation of multi-disciplinary pest management programs in agricultural crops. Offered in alternate years. Prerequisites: PLNT 331, 336 and 338. [0-0; 3-2]
- 435 (3) Pesticides – Chemistry, toxicology to target and non-target organisms, and usage of insecticides, herbicides and fungicides; metabolism, environmental fate and impact; regulatory, social and legal implications. Prerequisite: CHEM 230. Same as PHAR 435. (Offered in alternate years.) [3-0; 0-0]
- 498 (3) Undergraduate Essay – Preparation of a comprehensive and analytical review of an approved topic under the supervision of a faculty member. Prerequisite: Approval of the Head of the Department. Students should consult a Faculty Adviser before the end of classes in third year.
- 499 (6) Undergraduate Thesis – Design and execution of an experimental/analytical research project leading to preparation of a thesis. For some projects, a course in experimental design may be required. Students should consult a Faculty Adviser during the first term of third year. Approval of the project must be obtained from the Department prior to initiation, and in any event not later than October 1 of fourth year.
- 504 (3) Principles and Methodology in Field Ecology – The philosophy, principles and methodology appropriate for conducting applied ecological field research with emphasis on rangeland ecosystems.
- 508 (3) Molecular Genetics of Plant-Microbe Interactions – Molecular genetics of microbial pathogenesis and symbiosis on plants. Analysis of plant-pathogen recognition and host response to interaction with viruses, bacteria and fungi. Same as MICB 508. (Offered in alternate years.)
- 510 (3) Ecological Genetics – The genetic basis of ecological relationships. A review of basic population genetics will provide the background for further investigations of reproductive strategies, influences of population structure, predator-prey and plant herbivore interactions, crop genetic variability and other topics in basic and applied ecological genetics. Lectures and discussions.
- 511 (3) Advances in Fruit Crop Research – In-depth study of specific fruit crops or aspects of fruit crop production. Prerequisite: PLNT 411.
- 513 (3/6) c Advances in Plant Breeding – Recent advances in plant breeding methodology. Novel methods of gene transfer and the application of in vitro technology to breeding problems. Prerequisites: PLNT 413 and BIOL 433 or equivalent. (Offered in alternate years.)
- 514 (3) Plant Genetic Engineering Laboratory – Techniques of vector preparation, electroporation, microprojectile bombardment, and Agrobacterium-mediated plant transformation; selection of transformants, plant regeneration and confirmation of gene transfer at the DNA, RNA and enzyme levels. Limited enrolment; consent of instructors. [0-0; 1-6]
- 517 (3) Advanced Topics in Vegetable Crop Production – Physical, biochemical, physiological and technical concepts of production of vegetable crops, with emphasis on critical review of current research. (Offered in alternate years.)
- 523 (0) Graduate Research Seminar
- 525 (3) Physiological Origins of Crop Yield – Crop growth analysis. Relationships among crop density, planting patterns, canopy structure and dry matter productivity. (Offered in alternate years.)
- 530 (2-6) c Directed Studies
- 531 (3) Biological Control – Theory of biological control. Case histories. Concepts of natural insect population regulation. Development of integrated control programs and environmental manipulations. (Offered in alternate years.)
- 532 (3) Advanced Insect Physiology – Recent advances in selected fields of insect physiology, emphasizing the neural and/or hormonal integration of metabolic activities. Prerequisite: PLNT 432. (Offered in alternate years.)
- 533 (3) Herbicide Biochemistry and Physiology – Chemical structure and properties as they relate to the selectivity of herbicides, the mode and mechanism of herbicide action, and the fate of herbicides in plants. (Offered in alternate years.)
- 534 (3) Vectors of Plant Pathogens – Morphological and physiological specializations enabling insects and other arthropods, nematodes, fungi and higher plants to transmit plant pathogens. Mechanisms of transmission of viruses, mycoplasmas, bacteria, fungi and toxins causing plant diseases. Laboratories will emphasize pathogen transmission. Limited enrolment. [0-0; 2-3]
- 535 (3) Topics in Plant Pathology – Advances in techniques for pathogen detection, disease assessment and plant disease control. (Offered in alternate years.)
- 536 (3) Plant Virology – Identification, structure, biosynthesis and control of viruses causing plant diseases. Laboratories will emphasize instrumental techniques used in plant virus research. Limited enrolment. (Offered in alternate years.) [2-3; 0-0]
- 537 (3) Disease Physiology – Current research into the biochemical basis of plant pathogen recognition, pathogenesis and disease resistance. (Offered in alternate years.) Permission of instructor.
- 538 (3) Topics in Weed Ecology – The response of weed species to agricultural management practices will be considered within the context of ecological characteristics that make a species a weed. (Offered in alternate years.) (Same as BOTA 538.)
- 539 (3) Responses of Plants to Air Pollutants – Effects of air pollutants on the biochemistry, growth and yield of plants; involvement of climatological factors; methods of protection. (Offered in alternate years.)
- 540 (3) Plant Molecular Biology Laboratory – Techniques of purification, cloning, sequencing, restriction-hybridization analysis of plant nucleic acids, in vitro labelling of plant nucleic acids and proteins, and electrophoresis and immunodetection of plant proteins. Offered by the Biotechnology Teaching Laboratory in cooperation with the Department of Plant Science. Admissions to the course is limited and requires recommendation from the Head of the Department. Same as BOTA 544 and FRST 503. Pre- or corequisite: Recommended BIOL 335
- 549 (12) Master's Thesis
- 649 Ph.D. Thesis
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- Plastic Surgery**
SEE SURGERY, FACULTY OF MEDICINE
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- Polish** **POLS**
SEE PROGRAMS IN THE FACULTY OF ARTS UNDER
RUSSIAN AND SLAVIC LANGUAGES AND
LITERATURES
- 110 (6) Basic Polish – An introductory course. [3-1; 3-1]
- 210 (6) Second-Year Polish Prerequisite: POLS 110. [3-1; 3-1]
- 345 (3/6) d Introduction to Twentieth-Century Polish Literature – Readings and discussion of selected works of representative writers. Prerequisite: POLS 210 or equivalent. [3-0; 3-0]
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- Political Science** **POLI**
FACULTY OF ARTS
- 200 (3) The Government of Canada – An examination of the institutions and processes of Canadian government. [3-0]
- 220 (3) Foreign Governments – A comparative analysis of foreign governments. Specific countries to be covered will vary according to section; consult the brochure issued by the Department. [3-0]
- 240 (3) Introduction to Political Thought – An introduction to some of the major political theorists and to the principal ideologies in the modern world. [3-0]
- 260 (3) International Politics – The analysis of the relations between states. Includes such topics as the evolution of international systems. East-West and North-South issues, the techniques of wielding international influence (through diplomacy, propaganda, foreign aid, subversion, and war) and the sources and nature of international conflict and cooperation. This course is strongly recommended for students who will later take POLI 360-366. [3-0]
- 301 (3) Canadian Political Parties – The organization and operation of party politics and the systems of party competition in Canada. The focus is on national-level politics. Prerequisite: POLI 200. [3-0]
- 302 (3/6) d Public Administration – The structure and organization of the administrative branch of government in theory and practice. Administrative powers and policy-making in the modern state. Examples of the administrative processes are drawn from Canada and other countries. Prerequisite: POLI 200. [3-0] or [3-0; 3-0]
- 303 (3) Federalism in Canada – Theory and practice of federalism; cultural duality, social stresses, and problems of flexibility. The constitution and role of the courts. Prerequisite: POLI 200. [3-0]
- 304 (3) British Columbia Government and Politics – An examination of the party system, and other institutions and processes of the British Columbia political system. Prerequisite: POLI 200. [3-0]
- 305 (3) Canadian Political Ideas – Political theories and ideologies in Canada. Prerequisite: POLI 200. [3-0]
- 306 (3) Local Government and Politics in Canada – Local and regional political institutions and processes in Canada, with particular attention to those of Vancouver and other British Columbia localities. Prerequisite: POLI 200. [3-0]
- 307 (3) Quebec Government and Politics – The nature of politics and the conduct of government in contemporary Quebec. The course is open to students from fields other than political science. Prerequisite: POLI 200. [3-0]
- 320 (3/6) d Government and Politics of the United States of America – The institutions, behaviour, and policies of the political system of the US in a comparative context. The constitution and the major institutions of government and public policy. [3-0] or [3-0; 3-0]
- 321 (3/6) d Chinese Government and Politics – The political system of China, approached from a number of perspectives: as a continuing development within the framework of Chinese history and culture; as a case study of political modernization; in the context of world Communist movements; as an object of comparison with other political systems. [3-0] or [3-0; 3-0]
- 322 (3/6) d Japanese Government and Politics – The Japanese political system and political behaviour, with some coverage of neighbouring areas such as South Korea and Taiwan, with major emphasis on the period since 1945. [3-0] or [3-0; 3-0]
- 323 (3/6) d South Asian Government and Politics – Comparative analysis of politics and government in India, Pakistan, Bangladesh, and Sri Lanka. Imperial legacies and nationalist movements; political institution-building amidst socio-cultural diversity; parties and interest groups; elections and leadership crises; military intervention; ethnic and class conflicts; foreign policy. [3-0] or [3-0; 3-0]

- 324 (3/6) d Southeast Asian Government and Politics – The political systems of contemporary Southeast Asia. [3-0] or [3-0; 3-0]
- 325 (3) Communist and Post-Communist Politics – An examination of the origins, development, and demise of Communist political systems, as well as the nature of post-Communist politics, with special emphasis on the Soviet Union and its Russia. [3-0]
- 326 (3) European Politics: Selected Cases. – The politics and government of one or more European countries: political development, institutional structure, party politics, and policy-making. The specific country or countries will vary by section. (3-0)
- 327 (3) European Integration. – Post 1915 integration of Europe, comparison of national politics and attitudes to integration, and the history and institutions of the European Union. (3-0)
- 328 (3/6) d Topics in Comparative Politics – Topics will vary from year to year. Consult the brochure issued by the Department. [3-0] or [3-0; 3-0]
- 329 (3) Gender and Politics. – Relations between gender and political processes and institutions. (3-0)
- 340 (6) History of Political Ideas – An introduction to the political ideas of leading political philosophers from Ancient Greece to the 19th century. [3-0; 3-0]
- 342 (3) Modern Political Theory: Analysis of a Selected Theorist – A detailed examination of an acknowledged masterpiece of modern political theory. The text and attendant literature vary from year to year. Consult the brochure issued by the Department. [3-0]
- 344 (3) Social and Political Thought – An examination of some of the major concepts in political philosophy such as justice, equality, rights, obligation, liberty in the context of both classical and contemporary political thought. [3-0]
- 346 (3) Democratic Theory – An examination of both classical and contemporary theories of democracy. Representative democratic theory, participatory democratic theory, and their relationship to twentieth century concepts of democracy. [3-0]
- 349 (3) Modern Political Philosophy: Concepts, Themes and Thinkers – An examination of theoretical issues in Political Science. Seminal concepts and philosophical themes are illustrated in the writings of leading political thinkers from the early modern era to the present. Limited to Major and Honours students in Political Science. [3-0]
- 350 (3) Public Policy. – An introduction to public policy: rationales for government intervention, the influence of interest groups and political institutions on policy outcomes, and the various stages in the policy process. (3-0)
- 360 (3/6) d Strategic Studies – An analysis of the national security doctrines and policies of the major powers and Canada, the policies and politics of alliances, and problems of arms control and disarmament. [3-0] or [3-0; 3-0]
- 361 (3/6) d International Violence and Its Control – A study of the nature of international violence from guerrilla to nuclear war; a survey of theories of the causes of interstate war; recent research findings on the causes of war and conditions for peace; a comparative analysis of strategies for controlling violence through disarmament and the promotion of alternative means of conflict resolution. Students enrolling in this course should preferably have taken a second-year course in a subject in the social sciences. [3-0] or [3-0; 3-0]
- 362 (3) The Great Powers and International Politics – An examination of the changing nature of Great Power relations, including procedures and institutions for managing their conflicts, in the pre-Cold War, Cold War, and post-Cold War international systems. [3-0]
- 363 (3/6) d Canadian Foreign Policy – An analysis of Canadian foreign policy on important international issues since the 1960s and of the policy-making process. Issues may include defence commitments, economic relations, activities of international organizations, and relations with the U.S., Europe, U.S.S.R., Asia and the Third World. [3-0] or [3-0; 3-0]
- 364 (3/6) d International Organization – Analysis of the activities and influence of modern international organizations in international security, economic, and social issue areas. The course will focus on organizations associated with the United Nations, but other world and regional bodies will be analysed as well. [3-0] or [3-0; 3-0]
- 365 (3/6) d Asian International Relations – Analysis of the foreign policies of one or more of the states of East, Southeast, and South Asia. It will focus on their relations with other states in the region as well as with major outside powers. [3-0] or [3-0; 3-0]
- 366 (3) International Political Economy – An analysis of governmental policies and international political bargaining in regard to such issues as international investment, trade, and monetary relations. ECON 100 or 309 are recommended. [3-0]
- 367 (3/6) d International Relations Theory and the International System – The evolution of the international system and empirical and normative theories of international relations such as realism, liberalism, and Marxism. (3-0) or (3-0; 3-0)
- 380 (3) Quantitative Methods in Political Science – An introduction to quantitative methods as utilized in the study of Political Science. Not available for credit in the Faculty of Commerce and Business Administration. [3-0]
- 381 (3) Topics in Quantitative Analysis – Application of quantitative techniques to selected topics in Political Science. Topics vary from year to year. Consult the brochure issued by the Department. Prerequisite: POLI 380. [3-0]
- 385 (3/6) d Political Behaviour – The study of political attitudes, public opinion, voting and elections; the use of survey research. Prerequisite or corequisite: POLI 380. [3-0] or [3-0; 3-0]
- 390 (12) Honours Seminar – An examination of the dimensions of Political Science and the major debates within the discipline. [0-3; 0-3]
- 401 (3/6) d Canadian Provincial and Regional Politics – A seminar which examines political parties, processes, and institutions in the provincial political systems and regional arrangements between provinces. Prerequisites: POLI 200 plus one additional course in Canadian politics selected from 301-307. [0-2] or [0-2; 0-2]
- 402 (3/6) d Politics of the Canadian Constitutions – This seminar examines the creation and amendment of Canadian Constitutions; political aspects of the judicial system; political consequences of court decisions. Prerequisites: POLI 200 plus one additional course in Canadian politics selected from 301-307. [0-2] or [0-2; 0-2]
- 403 (3/6) d The Political Economy of Canada – A seminar devoted to the analysis of the interplay of economic and social factors in the shaping of Canadian politics: the major issues and strains in the functioning of the Canadian polity. Prerequisites: POLI 200 plus one additional course in Canadian politics selected from 301-307. [0-2] or [0-2; 0-2]
- 404 (3/6) d Public Policy and Its Administration – This seminar examines political and administrative aspects of public policy, particularly in Canada. Prerequisites: POLI 200 plus one additional course in Canadian politics selected from 301-307. [0-2] or [0-2; 0-2]
- 405 (3/6) d Topics in Canadian Politics – This seminar examines in depth some of the important issues in Canadian politics. Prerequisites: POLI 200 plus one additional course in Canadian politics selected from 301-307. [0-2] or [0-2; 0-2]
- 420 (3/6) d Advanced Topics in Comparative Politics: Western – A seminar devoted to comparative analysis of politics in the Anglo-American or European democracies. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in Comparative Politics (POLI 220, 320-328). [0-2] or [0-2; 0-2]
- 421 (3/6) d Advanced Topics in Comparative Politics: Non-Western – A seminar devoted to comparative analysis of politics in non-western states. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in Comparative Politics (POLI 220, 320-328). [0-2] or [0-2; 0-2]
- 422 (3/6) d Selected Problems in Comparative Politics – A seminar devoted to intensive analysis of a contemporary political problem from a comparative perspective, e.g., ethnic politics, class politics, the politics of post-industrial society. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in Comparative Politics (POLI 220, 320-328). [0-2] or [0-2; 0-2]
- 423 (3/6) d Issues in Comparative Government – A seminar devoted to comparative analysis of constitutionalism, authoritarianism, democracy, etc. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in Comparative Politics (POLI 220, 320-328). [0-2] or [0-2; 0-2]
- 424 (6) Chinese Political Thought and Institutions – See Asian Studies 417. [2-1; 2-1]
- 425 (6) Communist Movements in Eastern Europe since 1900 – See History 435. [3-0; 3-0]
- 440 (3/6) d Contemporary Political Theory – This seminar examines the political ideas of leading political philosophers of the twentieth century. Prerequisite: Any six credits in Political Theory (POLI 240, 340-349). [0-2] or [0-2; 0-2]
- 442 (3) Contemporary Political Theorists: Analysis of a Selected Theorist – This seminar examines in detail the political ideas of an important political philosopher of the twentieth century. The theorist studied varies from year to year. Consult the brochure issued by the Department. Prerequisite: Any six credits in Political Theory (POLI 240, 340-349). [0-2]
- 444 (3) Social Science and Political Theory – This seminar examines the political and social theories of the founders of modern social science through the relevant writings of such theorists as Tocqueville, Comte, Mill, Marx, Tönnies, Weber, and Durkheim. Prerequisite: Any six credits in Political Theory (POLI 240, 340-349). [0-2]
- 446 (3/6) d Topics in Political Thought – A seminar devoted to the intensive study of a concept, theme, or school in the history of political thought or contemporary political philosophy. Topics vary from year to year. Consult the brochure issued by the Department. Prerequisite: Any six credits in Political Theory (POLI 240, 340-349). [0-2] or [0-2; 0-2]
- 460 (3/6) d Foreign Policy Analysis – A seminar devoted to the analysis of the foreign policies of one or more states, as well as to the study of literature pertaining to foreign policy analysis. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in International Politics (POLI 260, 360-366). [0-2] or [0-2; 0-2]
- 461 (3) Peace and Conflict Studies – A seminar on a selected topic concerning the causes of war and strategies for the promotion of peace. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in International Politics (POLI 260, 360-366). [0-2]
- 462 (3) International Relations Theory – This seminar examines some of the major theoretical approaches to the study of international relations. For specific content in a given year, consult the brochure issued by the Department. Prerequisites: Any two courses in International Politics (POLI 260, 360-366). [0-2]
- 463 (3) International Interdependence – This seminar analyses issues relating to the politics of international economic relations. For specific content in a given year, consult the brochure issued by the Department. Prereq-

quisites: Any two courses in International Politics (POLI 260, 360-366). ECON 100 or 309 are recommended. [0-2]

- 464 (3/6) d Problems in International Relations – Content varies from year to year and is described in the brochures issued by the Department and the program in International Relations. One section (of 3 credits) is reserved for fourth-year students in the Major program in International Relations. [0-2] or [0-2; 0-2]
- 465 (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 is also offered as LAW 386. It may not be taken for credit in both Arts and Law. [3-0]
- 490 (6) Honours Seminar – Research seminar in specific areas in Political Science related to the students' interest and current faculty research. [0-3; 0-3]
- 491 (6) Honours Essay
- 501 (3) Canadian Government and Politics
- 502 (3) Canadian Political Institutions and Processes
- 503 (3) Canadian Political Parties and Participation
- 504 (3) Topics in Canadian Politics
- 511 (3) Comparative Government and Politics
- 512 (3) Theories in Comparative Politics: Political Development
- 513 (3) Theories in Comparative Politics: Cleavages and Integration
- 514 (3) Comparative Western Governments
- 515 (3) Comparative Non-Western Governments
- 516 (3) Issues in Comparative Politics
- 521 (3) Political Theory
- 522 (3) Topics in Political Theory
- 523 (3) Political Thought
- 531 (3) Public Administration
- 532 (3) Topics in Public Administration
- 533 (3) Topics in Public Policy
- 549 (6/12) c Master's Thesis
- 551 (3) Political Behaviour
- 552 (3) Research Seminar in Political Behaviour
- 553 (3) Topics in Empirical Theory
- 561 (3) International Relations
- 562 (3) Topics in International Relations
- 563 (3) International Organization
- 564 (3) Research Seminar in International Relations
- 571 (3) Methods of Political Analysis
- 572 (3) Quantitative Techniques of Political Analysis
- 580 (3/6) c Directed Studies
- 649 Ph.D. Thesis

Portuguese **PORT**
SEE DEPARTMENT OF HISPANIC AND ITALIAN STUDIES, FACULTY OF ARTS

Probability and Statistics
SEE DEPARTMENT OF STATISTICS, FACULTY OF SCIENCE

See entries under: ANTH, BIOL, COMM, ECON, EPSE, FRST, GEOG, HCEP, MATH, PCTH, PHED, PHYS, PLNT, POLI, PSYC, RHIME, SOCL, WOOD.

Psychiatry
FACULTY OF MEDICINE

PSYT

- 401 (2) Behavioural Sciences in Medicine – Lectures and discussions on the role and significance of psychological, social, cultural and behavioural factors for health and for medical practice. Effects on occurrence, course and outcome of both physical and mental illness and on personal development over the life course. Role of cultural factors in shaping symptoms and illness and their implications for clinical practice.
- 425 (3) Introduction to Psychiatry – (a) Psychopathology: Lectures and clinical demonstrations. The principal signs and symptoms of mental illness are described and demonstrated. (b) Interviewing techniques: Instruction as to the elicitation and recognition of the principal signs and symptoms of psychiatric disorders. (c) Introduction to the major clinical syndromes in Psychiatry.
- 450 (8) Principles of Clinical Psychiatry – A systematic introduction to clinical psychiatry is given through seminars, video-tapes, time for self-directed study, patient interview demonstrations during supervised clinical experience.
- 451 (3) Neurochemistry – The main objective of this course on neurochemistry is to describe biochemical phenomena that subserve activity of the nervous system or are associated with neurological diseases. Lectures designed primarily for third year medical students as a basic science elective course. Departmental approval.
- 452 (3) Seminars in Behavioural Sciences – Weekly seminars dealing with behavioural science topics related to medical practice. Third year elective for Medical students.
- 475 (12) Psychiatry Clinical Clerkship – Consolidation of knowledge and skills learned in previous years in diagnostic assessment, psychopathology, understanding of etiology and psychodynamics, biological treatments and psychotherapies. Knowledge applied to develop comprehensive diagnostic formulation and treatment plans. Supervised treatment of adult inpatients and outpatients, participating within a multi-disciplinary team. Assessment and treatment of a child and family. Seminars on selected topics including emergency psychiatry, psychopharmacology, community resources, sexual medicine, child psychiatry.
- 500 (2) 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 (2) Psychopathology – A series of lectures and seminars concerned with a presentation for first-year graduate students of signs, symptoms and syndromes in psychiatry. Texts and readings are assigned.
- 502 (2) The Interview and the Examination of the Patient – Lectures and demonstrations for first year graduate students concerned with the concepts, processes and clinical skills required in interviewing for both diagnosis and treatment. Texts and readings are assigned.
- 503 (2) Psychotherapy I – This introductory course is conceptualized as a direct continuation of PSYT 502 (2) The Interview and the Examination of the Patient. This is an introductory course which will focus on the study of principles and practice of interpersonal and social management of general psychiatric patients in in-patient and ambulatory clinical settings. Didactic seminars with demonstrations and practicum, with audio-visual documentary recordings for self-study. Assigned literature.
- 504 (2) 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. Prerequisites: PSYT 501 and 502.
- 505 (2) Methods in Evaluation and Research – A course of seminars and demonstrations dealing with methods and techniques for the evaluation of programs 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.

- 507 (4) Psychotherapy II Course of lectures, seminars and demonstrations concerned with the processes, techniques and concepts of individual psychotherapy. Includes initial assessment, ongoing evaluation of progress and assessment of outcome of patients undergoing reintegrative or reconstructive psychotherapy. A preliminary review of major schools and approaches to psychotherapy is given. Texts and readings are assigned. Prerequisites: PSYT 501, 502, 503.
- 508 (2) Group, Milieu, Family, Marital Psychotherapies I – This is an introductory course primarily for first year psychiatric residents, to outline theoretical framework of small social group in which the interpersonal processes can be conceptualized; to achieve an understanding of the function of the individual in the context of natural groups; to develop basic skills in observing patients' groups, paying balanced attention to individual members and the group as a whole; to demonstrate a variety of verbal and non-verbal techniques used in group, family and milieu therapy; residents' experiential group.
- 510 (4) 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. Texts and readings are assigned. Prerequisites: PSYT 501 and 504.
- 511 (2) The Neurological Basis of Human Behaviour (Laboratory) – Dissections and demonstrations of the structure and functions of the human nervous system. Prerequisite: PSYT 510.
- 513 (2) 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: PSYT 501. Texts and readings to be assigned.
- 515 (2) 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: PSYT 501. Texts and readings to be assigned.
- 520 (4) 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. *Offered to second and third year graduates.
- 523 (4) Psychotherapy III – An advanced course concerned with the processes, techniques as well as theories of individual psychotherapy. Concepts of major psychotherapy schools and their relationships to personality theories are critically reviewed and compared. Brief intensive psychotherapies, behavioral psychotherapy, hypnotherapy, crisis intervention, etc., are studied. Principles of psychotherapeutic management and ongoing evaluation of cases appropriate to these various modalities of psychotherapy are demonstrated and practiced. Readings will be assigned. Prerequisite: PSYT 507.
- 524 (4) Psychotherapy IV – An advanced course of lectures, seminars, demonstrations and practice, concerned with theoretical issues and practical approaches to the management of difficult individual cases, e.g., personality disorders, psychotic states in remission, etc. The spectrum of therapeutic problems chosen for study will seek to integrate concepts of treatment of individuals of all ages, from the very young to the geriatric case. Texts and readings will be assigned. Prerequisites: PSYT 503, 507, 523.

- 530 (4) 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 (2) Child Psychiatry – This course deals with diagnosis, prevention and treatment of mental illness and mental retardation in children. Prerequisite: PSYT 530.
- 550 (6) Directed Studies – This provides for a program of directed reading and study in such special areas as may be relevant to the student engaged in some particular field of study and research in Psychiatry.
- 700 Problem Patient Conference – All residents on service attend. The resident outlines the particular problem presented, interviews the patient behind a one-way screen, and this is followed by a discussion with the clinical supervisor and the other residents. Two hours weekly.
- 701 Ward Rounds – Attended by clinical supervisor, all residents and representatives of other members of the treatment team. Patients are presented, discussed, and diagnosis and treatment formulated.
- 702 Out-patient Supervision – The clinical supervisor meets with each resident individually for one hour per week to discuss out-patients.
- 705 Ward Management Meeting – A meeting held once a week, attended by all staff (including the clinical supervisor), which focuses on staff conflicts which impair effective work relationships.
- 704 Individual Case Supervision – This is provided to two residents per week on an individual and rotating basis, and provides in-depth supervision of selected in-patients.
- 705 Tutorial – Each student in the postgraduate program is assigned a tutor. These weekly two-hour sessions are devoted to discussion and study of long-term psychotherapy cases.
- 706 Departmental Conference – All residents are expected to attend these conferences. Presentations are made by faculty, residents, and visiting speakers. One and one half hours weekly.
- 707 Group Therapy – Each resident is expected to carry, or participate in group therapy sessions. Supervision is available for this activity. Two hours weekly.
- 717 Human Sexuality – Clinical experience in the University sex therapy unit in the Department of Psychiatry. Instruction in interviewing, assessment, and treatment of individuals and couples with problems in sexual function. Part-time rotation two days per week for a three-month period.
- 720 Child Psychiatry Conference – Every two weeks, 1.5 hours are spent by residents in Child Psychiatry, under the supervision of a member of the Division of Child Psychiatry, either in the one-way screen evaluation and subsequent discussion of a family or in the seminar presentation of a topic in the field of child psychiatry.
- 721 Adolescent Services – Every two weeks, 1.5 hours are spent in a case conference and 1-1/2 hours per month in a literature seminar. Residents also spend 2-5 hours weekly, treating adolescents and their families. Residents are exposed to, and follow patients through, a spectrum of care; community, out-patient, day treatment and residential treatment. Reading assigned.
- 722 Community Consultation – Residents have a supervised placement with a community agency (e.g. school, child welfare agency, juvenile court) to learn how to be a mental health consultant, optimizing the skills of primary professionals in contact with disturbed children (1-1/2 hours per week.) Reading assigned.
- 723 Services for Handicapped Children – Residents are exposed to the spectrum of care available for handicapped children, working with and supervised by a faculty member. Residents also treat a family or families in which there is a handicapped child. (Three hours per week.)
- 724 Clinical Work and Supervision – Two hours are spent each week in the supervision of the clinical work of residents in Child Psychiatry by a member(s) of the Division of Child Psychiatry. During this time, the evaluation and treatment of cases are discussed in detail, generalizations are made about the clinical syndromes presented, and the relevant literature is introduced for discussion. At least ten hours of clinical work per week form the basis of this supervised work.
- 725 Multidisciplinary Assessment of Seriously Disturbed Children – Each week, 2-3 hours are spent in multidisciplinary case conferences concerning children admitted to E1A (an assessment unit for disturbed children at the Health Centre for Children at the Vancouver General Hospital). Further involvement may include following a family through intake and assessment (three hours per week), involvement with groups (two hours per week), or more intensive involvement (10-20 hours per week). Reading assigned.
- 726 Family Therapy – In addition to regular ongoing supervision of family therapy, there is a seminar series (two hours weekly) devoted to family theory and practice. Reading assigned.
- 750 Postdoctoral Internship in Clinical Psychology – A one-year program for clinical psychologists who wish to develop specified skills in mental health intervention. Supervised training at University affiliated hospitals by Department of Psychiatry faculty includes: the behavioural approaches to marital discord, anxiety disorders, reactive depression, sexual dysfunction and habit disorders; the development of psychological assessment, consultation and treatment evaluation skills; the development of acute patient (i.e. inpatient) management skills; and the development of community team and interdisciplinary interaction skills. Prerequisites include a doctoral degree in clinical psychology.

Psychology FACULTY OF ARTS

PSYC

Psychology – Unless otherwise specified, the prerequisite for 300-level Psychology courses is PSYC 100 or six credits of 200-level Psychology courses or permission of the instructor.

Students registered in the B.Sc. Psychology program must elect Faculty of Arts course other than Psychology to satisfy the Faculty of Science requirement of 18 credits of Arts. Credit will not be given for both Psychology 260 and 200, and 201 or 202, 366 and 317 or 318, or 360 and 304. In addition to Psychology 348 and 448, all Psychology courses numbered 60 or higher in the last two digits have Science credit but they cannot be used to satisfy the science requirements of the Faculty of Arts.

Students with fewer than 36 previous credits may not take 300-level courses; students with 36-40 previous credits may take up to six credits of 300-level courses. Third year students may not take 400-level courses, except 417, for which they must obtain permission of the instructor.

- 100 (6) Introductory Psychology – Emphasis on current research and the psychologist's approach to problems in the context of representative theories and issues in psychology. Specific topics of study selected by individual instructors vary considerably from section to section. [3-0-0; 3-0-0]
- 201 (3) The Biopsychology of Behaviour – Included are the neural and hormonal substrates of motivated and emotional behaviour, the biopsychology of learning and memory, the adaptive nature of perceptual systems, and genetic factors in behavioural differences. [3-0-0]
- 202 (3) Cognition and Perception – Attention, perception, learning, memory, language, decision-making, and problem-solving. Methods used to study these domains; critical empirical and theoretical issues. [3-0-0]
- 203 (3) Personality and Social Psychology – Focus on self-esteem, prejudice, and interpersonal attraction; discussion of research findings but no emphasis on research methodology. [3-0-0]
- 204 (3) Abnormal and Health Psychology – Introductory survey; includes the role of psychological stressors in illness and the major models of psychopathology and their application. [3-0-0]
- 260 (6) Experimental Psychology and Laboratory – Detailed introduction to experimental and theoretical aspects of motivation, sensation, perception and learning. Prerequisites: completion of first year Science program or equivalent and permission of the Head of the Department. [3-2-0; 3-2-0]
- 300 (6) Behaviour Disorders – The definition, history, and scope of deviant behaviour, emphasis on the psychological factors that control its origins, maintenance, and modification. [3-0; 3-0]
- 302 (3) Infancy – Human cognition, perception, motor, social, emotional needs, brain development and their interactions from birth until the emergence of language. [3-0]
- 303 (3) Tests and Measurements 1 – Theory and practice of mental measurement, test reliability and validity, uses, administration, scoring, and interpretation of tests. [3-0; 0-0]
- 304 (6) Brain and Behaviour – The neurobiological bases of behaviour: brain processes involved in perception, motivation, emotion, psychopathology, learning and memory. Open to all Arts and Science majors except those in the B.Sc. program. [3-0-0; 3-0-0]
- 305 (6) Theory of Personality – Approaches and principal theoretical problems; research theories of personality as represented by psychological systems. [3-0-0 3-0-0]
- 306 (6) Principles of Animal Behaviour – Theory of evolution; behavioral genetics; social systems as ecological adaptation; mating and parental strategies; instinct and learning; evolution of human behaviour. Credit will be given for only one of BIOL 310 or PSYC 306. [3-0-0; 3-0-0]
- 307 (6) Motivation – Experimental analysis of hunger, thirst, exploratory and curiosity behaviour, maternal and reproductive behaviour, fixed action patterns, and complex processes involved in social motivation. [3-0-0; 3-0-0]
- 308 (6) Social Psychology – Theory and research of individual social behaviour; social motivation; attitudes; group interaction; socialization; prejudice. [3-0-0; 3-0-0]
- 309 (6) Cognitive Processes – Contribution of cognitive processes to perception, attention, and memory; cognitive development, language, thinking, and creativity. [3-0-0; 3-0-0]
- 310 (6) Learning – Experimental findings and theory of the learning process; emphasis on the theoretical formulation of the necessary conditions for learning, retention, and transfer of training. [3-0-0; 3-0-0]
- 312 (6) History of Psychology – The principal trends of psychological explanation and events in the history of psychology from the earliest times to the present. Open only to Major or Honours students or by permission of the instructor. [3-0-0; 3-0-0]
- 313 (6) Sensation and Perception – Historical origins of interest in sensation; sensory systems and perceptual processes; psychophysics and neurophysiological approaches. [3-0-0; 3-0-0]
- 314 (3) Health Psychology – Health-related behaviours such as smoking and drug use; effects of stressful events on health; methods for coping with stress; impact of chronic illness on the family; social support systems. [3-0-0]
- 315 (3) Childhood and Adolescence – Human development from the preschool period through adolescence. [3-0-0]
- 317 (3) Research Methods and Design – Introduces behavioral research methods and designs; types of data and data description procedures; experimental designs (laboratory, field research methods); report writing. [3-0-0]

- 318 (3) Analysis of Behavioural Data – Introduces behavioral data analysis; the use of inferential statistics in psychology and conceptual interpretation of data; experimental design (laboratory, field research methods); presentation of data analyses in reports. Prerequisite: PSYC 317. [3-0-0]
- 319 (3) Applied Developmental Psychology – Applications of theories and research in developmental psychology to contemporary social issues; topics may include day care, child abuse, divorce and remarriage, substance abuse, sexuality. [3-0-0]
- 320 (6) Psychology of Gender – Physical, psychological, and cultural influences. [3-0-0; 3-0-0]
- 321 (6) Environmental Psychology – Psychological theory and research on the interaction between organisms and the physical environment; emphasis on applications to the design and management of constructed and natural environments. [3-0-0; 3-0-0]
- 322 (3) Adulthood and Aging – Issues, theories, and psychological research regarding adulthood and the aging process. [3-0-0]
- 323 (3) Tests and Measurements II – A survey of tests for assessing intelligence, abilities, personality, motivation, and interests. Prerequisite: PSYC 303. [3-0-0]
- 325 (3) Socialization: Development in Context – Human development from the perspective of the context in which it occurs, including cultural, historical, technological, institutional, and socio-economic factors. [3-0-0]
- 333 (3) Memory, Historical, Clinical and Cognitive Perspectives – Classical and contemporary metaphors for memory and their impact on theory development. [3-0]
- 334 (3) Memory II – Organic amnesia; remembering childhood events; the self and memory; and the problem of distinguishing genuine from simulated forgetting. Prerequisite: PSYC 333. [3-0]
- 336 (3) The Psychology of Language I – Psychological abilities underlying human language; language processing, lexical representation, and principles of on-line conversation; animal versus human communication. Prerequisite: PSYC 100, or six credits of 200-level Psychology courses, or LING 100 or 200. [3-0-0]
- 337 (3) The Psychology of Language II – Language and thought; deriving psychological principles from language universals; the psychology of literacy, dyslexia, multilingualism, and natural language processing. Prerequisite: PSYC 336 or permission of the instructor. [3-0-0]
- 340 (2-6) c Directed Studies in Psychology – Directed investigation of a problem, requiring a written report of the findings. Prerequisite: satisfactory standing and permission of a faculty member who is prepared to supervise the investigation.
- 348 (2-6) c Directed Studies in Biopsychology – Directed investigation of an experimental problem requiring a written report of the findings. Prerequisite: satisfactory standing in PSYC 260 and permission of a faculty member who is prepared to supervise the investigation.
- 350 (6) Psychological Aspects of Human Sexuality. – Human sexuality from a biopsychological, behavioural, and psychosocial perspective. (Only available at Okanagan University-College.) (3-0; 3-0)
- 355 (3) Fundamentals of Cognitive Science – Covers psychology, artificial intelligence, linguistics, philosophy and neuro-science; hands-on experience with different research methods of cognitive science; how the goals of the contributing disciplines complement each other. Corequisite: PSYC 317. [3-0-0]
- 360 (6) Biopsychology – The relationship between the nervous system and behaviour; the physiological basis of perception, motivation, learning, and memory. Prerequisite: PSYC 260 or permission of the Head of the Department. [3-0-0; 3-0-0]
- 366 (6) Methods in Research – Detailed coverage of basic research methods; the design of experiments and statistical analysis; methods will be applied in laboratory and project work. Prerequisite: PSYC 260 or in Honours program. [3-2-0; 3-2-0]
- 401 (6) Clinical Psychology – The theoretical and research foundations of the processes of assessment and behaviour modification in clinical psychology. Prerequisite: PSYC 300 or permission of the instructor. [3-0-0; 3-0-0]
- 403 (6) Human Emotion – Developmental, cognitive, and social psychological theories and research on human emotion. Prerequisite: PSYC 305, 308, 309, or 302 and 315. [3-0-0; 3-0-0]
- 408 (6) Social Psychological Research – Representative studies on social psychological topics; emphasis on the formulation of significant questions and the design and execution of relevant research. Prerequisite: PSYC 308 and either 317 or 366, or permission of the instructor. [3-2-0; 3-2-0]
- 412 (3) Cognitive Development – The development of fundamental cognitive abilities from infancy through adulthood, including traditional approaches to cognitive development as well as new areas of current investigation. Prerequisite: one of PSYC 302, 315, 319, 322, 325. [3-0-0]
- 413 (3) Social and Personality Development – Comprehensive overview of the psychological processes in the social and personality development of infants, children, and adolescents. Prerequisite: one of PSYC 302, 315, 319, 322, 325. [3-0-0]
- 414 (6) Research Methods in Developmental Psychology – Principal research methods and designs; students undertake supervised research projects. Prerequisite: PSYC 318 or 366 and any two of PSYC 302, 319, 322, 325 or permission of the instructor. [3-3-0; 3-3-0]
- 415 (6) Applied Social Psychology – The application of social psychological research and theory to the solution of social problems. Prerequisite: PSYC 308 and either PSYC 317 or 366. [3-0-0; 3-0-0]
- 417 (3/6) d Special Topics in Psychology – Intensive examination of selected topics and issues in psychology. Prerequisite: PSYC 317 or 366. [3-0-0] or [3-0-0; 3-0-0]
- 430 (6) Forensic Psychology – The implications of theory and research in psychology for the criminal justice system. [3-0-0; 3-0-0]
- 440 (2-6) c Directed Studies in Psychology – Directed investigation of a problem, requiring a written report of the findings. Prerequisite: satisfactory standing and permission of a faculty member who is prepared to supervise the investigation.
- 448 (2-6) c Directed Studies in Biopsychology – Directed investigation of an experimental problem requiring a written report of the findings. Prerequisite: satisfactory standing in PSYC 360 and permission of a faculty member who is prepared to supervise the investigation.
- 449 (6) Honours Seminar and Essay – Students carry out a research project and report on its development during seminars. Students also discuss research by Departmental staff, with emphasis on choice of problems, research design and data analysis.
- 460 (6) Hormones and Behaviour – Detailed examination of relations between hormones and behaviour; emphasis on the role of prepubertal and postpubertal hormones in sexual behaviour and aggression. Prerequisite: PSYC 304 or 360 or permission of the Head of the Department. Permission will normally be granted to students in third- or fourth-year life sciences programs. [3-0-0; 3-0-0]
- 463 (6) Research in Sensation and Perception – Vision and audition; physical properties and subjective experience of stimuli. Prerequisite: PSYC 313 or 360; PSYC 318 or 366; or permission of the Head of the Department. [2-3-0; 2-3-0]
- 464 (3) Advanced Research Methods in the Behavioural Sciences – Designed to prepare students for graduate studies or other advanced behavioral research. Inferential statistics and advanced conceptual interpretations of data; various experimental designs and computer applications. Prerequisite: PSYC 318. [3-2-0]
- 465 (6) Computers in Psychology – Applications of computers unique to psychology. Prerequisite: PSYC 318 or 366, or permission of the Head of the Department. Microcomputer programming experience desirable but not necessary; students can learn this early in the course. [2-2-0; 2-2-0]
- 466 (6) Research Methods in Animal Learning and Cognition – Supervised research project on learning, memory or other cognitive process. Prerequisites: PSYC 317 or 366 and at least one of the following: PSYC 304, 306, 309, 310, 360, or BIOL 310; or permission of the Head of the Department. [2-3-0; 1-4-0]
- 467 (3/6) d Physiological Psychology Laboratory – Laboratory methods for studying the relation between brain and behaviour. Prerequisite: PSYC 304 or 360 and PSYC 317 or 366; or permission of the Head of the Department. [0-6-0] or [0-6-0; 0-6-0]
- 500 (3/6) d History of Psychology
- 513 (3) Special Topics in Developmental Psychology
- 514 (3) Advanced Topics in Biopsychology – Not offered each year; consult Department of Psychology.
- 515 (3) Animal Behaviour
- 516 (3) Animal Learning, Memory, and Cognition – Not offered each year; consult Department of Psychology.
- 517 (3) Biopsychology of Motivation – Not offered each year; consult Department of Psychology.
- 520 (3) Developmental Biopsychology – Not offered each year; consult Department of Psychology.
- 521 (3/6) d Psycholinguistics

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Any transfer of credit to UBC for course work conducted at other educational institutions is based solely on the UBC Transfer Guide, which may be obtained from the Registrar's Office.

- 522 (3) Drugs and Behaviour – Not offered each year; consult Department of Psychology.
- 523 (3) Experimental Neuropsychology and Animal Models – Not offered each year; consult Department of Psychology.
- 524 (3) Neural Models of Learning and Memory – Not offered each year; consult Department of Psychology.
- 525 (3) Attitudes and Social Cognition – To be offered in alternate years only.
- 526 (3) Individuals and Groups – To be offered in alternate years only.
- 527 (3) Interpersonal Processes – To be offered in alternate years only.
- 528 (3) Advanced Methods in Social Psychology and Personal – To be offered in alternate years only.
- 529 (3) Special Topics in Social Psychology – Not offered each year; consult Department of Psychology.
- 530 (3) Assessment through Interviewing Techniques
- 531 (3) Behavioural Assessment
- 532 (3) Child Assessment
- 533 (3/6) d Current Issues in Clinical Psychology
- 534 (2-12) c Professional Issues and Clinical Psychology Practicum
- 535 (3) Psychopathology of the Adult
- 536 (3) Psychopathology of the Child
- 540 (3/6) d Strategies of Psychological Intervention
- 542 (3) Cognitive/Behavioural Interventions
- 543 (3/6) d Special Topics in Theory
- 544 (3/6) d Patterns of Child-Rearing
- 545 (6) Advanced Statistics I
- 546 (2/6) d Seminar in Psychological Problems
- 547 (2-6) c Reading and Conference
- 548 (2) Departmental Seminar
- 549 (3/6) c Master's Thesis
- 550 (3/6) d Offenders and Their Victims
- 551 (3/6) d Psychology and the Criminal Justice System
- 552 (3) Ethics and Professional Issues for Forensic Psycho
- 553 (3/6) d Advanced Topics in Forensic Psychology
- 555 (3) Advanced Topics in Cognitive/Behavioural Intervention
- 560 (3) Clinical Research Design
- 566 (3) Theories of Personality – To be offered in alternate years only.
- 567 (3) Personality Dimensions and Structure – To be offered in alternate years only.
- 568 (3) Personality Assessment – To be offered in alternate years only.
- 569 (3) Contemporary Conceptual Issues in Personality – To be offered in alternate years only.
- 570 (3) Environmental Psychology I
- 571 (3) Environmental Psychology II
- 573 (3) Industrial Psychology
- 574 (3) Biopsychology I
- 575 (3) Biopsychology II
- 578 (3) Perceptual Processes I
- 579 (3) Perceptual Processes II
- 582 (3) Cognitive Processes I
- 583 (3) Cognitive Processes II
- 586 (3) Developmental Psychology I
- 587 (3) Developmental Psychology II
- 590 (3) Survey of Social Psychology I
- 591 (3) Survey of Social Psychology II
- 592 (3) Neuroethology – Not offered each year; consult Department of Psychology.

- 593 (3) Neurophysiology and Cortical Plasticity – Not offered each year; consult Department of Psychology.
- 594 (3) Psychoneuroendocrinology – Not offered each year; consult Department of Psychology.
- 595 (3) Psychophysiology – Not offered each year; consult Department of Psychology.
- 596 (3) Strategies and Techniques of Studying Behaviour – Not offered each year; consult Department of Psychology.
- 649 Ph.D. Thesis

Punjabi **PUNJ**
SEE ASIAN STUDIES, SOUTH ASIAN LANGUAGES

Radiology **RADI**
FACULTY OF MEDICINE

- 465 (1) Principles of Radiological Diagnosis – A series of small group tutorial sessions to acquaint the student with the use of X-ray in diagnosis.
- 700 Physics and Technology for Radiology – During the first month of residency training, didactic instruction is given at the British Columbia Institute of Technology in the physics of Radiology and the fundamentals of radiographic technology (radiography). During this one-month residency period, the resident is trained in radiographic technology by working as a technologist at one of the affiliated hospitals. Eight hours daily.
- 701 Continuing Instruction in Basic Sciences – During the four years of training in Radiology and/or Nuclear Medicine, scheduled and unscheduled instruction is given in physics (one hour per week) and pathology correlated with radiology (one hour per week).
- 702 Clinical Investigation or Research – Each resident is encouraged to complete an investigative project in each of the four years in Radiology, under the supervision of a faculty member, for possible presentation at an annual department meeting. Average 80 hours each year.
- 703 Current Topics in Radiology – Approximately six internationally recognized authorities in Radiology and two or three in Nuclear Medicine are invited to visit this department each year for one to five day periods, during which lectures, consultations and small group seminars are given.
- 704 Instruction in Clinical Radiology – Daily and weekly departmental teaching sessions are held. In addition, the department participates in ward rounds and seminars with other clinical speciality departments. Eight hours weekly.
- 705 Elective Periods – During the third and fourth years of Radiology for eight hours daily, elective periods of one to twelve months, as acceptable to the resident and the Program Director, are available for two or more of the radiologic subspecialties including computed tomography, ultrasound, neuroradiology, paediatric radiology, nuclear medicine, angiography, interventional radiology and magnetic resonance imaging.
- 710 Clinical Nuclear Medicine – Daily discussions of the clinical applications of Nuclear Medicine. (See PATH 730).
- 711 Progress in Nuclear Medicine – Weekly reviews of current literature topics in Nuclear Medicine. (See PATH 731).
- 712 Clinical Investigation/Research – Participation in ongoing research projects within the Division. (See PATH 732).
- 713 Audit in Nuclear Medicine – Review of diagnostic Nuclear Medicine procedure. Correlation with other diagnostic tests and final patient diagnosis. Also offered as PATH 733.

Radiation Oncology
SEE SURGERY, FACULTY OF MEDICINE

Reading Education **READ**
SEE LANGUAGE EDUCATION, FACULTY OF EDUCATION

Rehabilitation Sciences
SCHOOL OF REHABILITATION SCIENCES, FACULTY OF MEDICINE. SEE COURSES BELOW UNDER REHABILITATION SCIENCES, OCCUPATIONAL THERAPY, AND PHYSICAL THERAPY

- Rehabilitation Sciences** **RHSC**
- 201 (3) Kinesiology – Analysis of human movement in terms of the biomechanics, anatomy, and physiology (basis of kinesiology) as a foundation for the study of abnormal performance. [1-1; 1-1]
- 202 (2) Human Development for Habilitation & Rehabilitation. (1-2; 0-0)
- 205 (2) Adaptive Equipment and Techniques – Use of techniques and equipment to facilitate adaptation to disability [1-2; 0-0]
- 301 (6) Medical and Surgical Conditions – An introduction to medical and surgical conditions for therapists. [4-0; 2-0]
- 302 (3) Psychosocial Aspects of Disability – Examination of cultural, psychological and social components associated with reactions to disability, illness and dying. Study of principles fundamental to effective relations for adjustment, conflict resolution and coping. [0-0; 3-0]
- 311 (1) Interpersonal Communication in Rehabilitation – Basic theories, principles and skills of interpersonal communication, including interviewing. [5-1; 0-0]
- 402 (3) Introduction to Scientific Inquiry – Introduction to the principles of clinical research design, scientific writing and clinical data analysis. [1.5-0; 1.5-0]
- 408 (2) Management and Policies in Health Care – Health systems and management concepts for rehabilitation providers. [1-0; 1-0]
- 420 (4) Elements of Neuroanatomy and Neurophysiology – An introduction to the structure and function of the human nervous system. (2-3; 0-0)
- 427 (6) Selected Problems in Rehabilitation – Individual and group study of current problems, topics, and trends in rehabilitation medicine. Includes field analysis, literature review, discussion and student projects.
- 429 (1-6) d Rehabilitation Seminar – Topics based on the academic needs of participating students. Not offered each year. Consult the School.
- 500 (3) Advanced Concepts for Rehabilitation Research – Issues relevant to clinical investigations in rehabilitation. Emphasis on research design, measurement issues, selection of analytical approaches, and relevant epidemiological concepts. Prerequisite: RHME 402, or equivalent.
- 502 (3) Rehabilitation Theory – The history, evolution and analysis of conceptual systems underlying practice in occupational therapy and physical therapy.
- 504 (3/6) c Directed Studies in Rehabilitation – Review of an area of rehabilitation practice within the student's designated area of concentration under the supervision of the student's adviser. Open only to Rehabilitation Sciences graduate students. Corequisite: RHME 500.
- 506 (3) Current Topics in Rehabilitation –
- 508 (3) Cross-cultural Issues in Rehabilitation – Relationships between culture and health, illness and disability, and an evaluation of the theoretical approaches and methods used in health and rehabilitation-related research within the Canadian context.
- 510 (3) Disability: Social, Economic and Political Influence – Interrelationships between disability and the social, economic and political environment, with emphasis on factors shaping experiences of health and illness. The social consequences of disability in the context of family, community and workplace.
- 515 (3) Exercise Physiology and Metabolism in Injury and Disease – Physiological factors underlying fatigue and recovery from injury and disease. Energy metabolism,

substrate utilization, and the effects of training on skeletal muscle, and on respiratory and cardiovascular systems.

520 (3) Neurorehabilitation – Therapeutic approaches and strategies in physical and occupational therapy for persons with motor control problems resulting from central nervous system dysfunction.

549 (6) Thesis

Occupational Therapy RSOT

207 (6) Theory and Practice – Conceptual frameworks will be employed to solve problems of clients with motor, sensory, cognitive, perceptual and social dysfunctions. The function/dysfunction continuum will be utilized to analyse activities for clients of all ages. [1-4; 1-4]

235 (2) Clinical Fieldwork

303 (4) Clinical Conditions in Psychiatry – The etiology, epidemiology, natural history, management and treatment of psychiatric disorders of childhood, adolescence and adulthood. [2-0; 2-0]

307 (4) Psychosocial Dysfunction – Application of a systematic problem-solving approach to the occupational therapy process in mental health. An introduction to group therapy and theory and intervention strategies employed in the treatment and rehabilitation of psychosocial dysfunction. [1-2; 1-2]

312 (2) Tests and Measures – Selection, administration, recording and interpretation of tests and measures used in occupational therapy assessment. [1-0; 0-2]

322 (4) Biomechanical Treatment Approaches – An introduction to problem-solving using biomechanical principles. Includes theory and treatment strategies for clients of all ages with physical disabilities, as well as the design and fabrication of orthotic and remedial equipment. [0-0; 1-4.5]

323 (3) Neurorehabilitation – Theories and approaches to neurorehabilitation across the lifespan. [0-0; 1.5-3]

335 (6) Clinical Fieldwork

416 (3) Vocational Rehabilitation – Assessment and management of vocational problems with particular emphasis on evaluating work skills, developing work adjustment programs, and use of community resources. [1-3; 0-0]

418 (2) Assistive and Rehabilitation Technology – Application of technology to enable independent living by persons with disability. [1-2; 0-0]

423 (3) Neurorehabilitation – Theories and approaches to neurorehabilitation across the lifespan. [1.5-3; 0-0]

424 (2) Program Design – Seminar sessions and self-directed study requiring students to explore the occupational therapy program design process. [1-2; 0-0]

425 (1) Social and Professional Issues – A seminar addressing current sociopolitical, cultural and ethical issues influencing occupational therapy practice. [1-0; 0-0]

426 (3) Directed Studies.

434 (3) Clinical Reasoning: Advanced Applications to Client-Centred Practice. [0-0-0; 2-0-2]

435 (7) Clinical Fieldwork

436 (3) Ergonomics and Organization of Activity – Application of theory and principles of ergonomics, task analysis and environmental adaptations for fulfilment of occupational, educational or vocational roles. [5-3; 0-0]

Physical Therapy RSPT

203 (2) Cardiorespiratory Clinical Skills – An introduction to the concepts of testing and measurement, followed by the principles and practice of physiotherapy for the cardiovascular and respiratory systems of the medically stable patient. [0-0; 1-2]

206 (3) Introduction to Physical Therapy Procedures – The theory and practice of basic therapeutic exercise, massage

techniques, introduction to patient handling and body mechanics. [1-4; 0-0]

208 (3) Physical Assessment of the Musculo-Skeletal System – The theory and practice of basic methods of physical assessment as applied to the musculo-skeletal system. [0-0; 1-2]

230 (2) Clinical Fieldwork – Observation and supervised participation in a variety of health care facilities for four weeks during the summer.

304 (2) Management of the Musculoskeletal System – The application of assessment and treatment skills to problems as a result of musculoskeletal dysfunction. [0-4; 0-0]

305 (3) Electro and Hydrotherapy – The clinical use of electrotherapy, hydrotherapy, selected conductive energy, electromyography, biofeedback and electrodiagnostic procedures. [1.5-1.5; 5-1.5]

308 (2) Management of Musculoskeletal and Neuromuscular Dysfunction – The clinical application of principles of management to musculoskeletal and neuromuscular dysfunction in children and adults. [0-0; 1-2]

313 (2) Management of the Respiratory System – Assessment and treatment of common disorders of the respiratory system affecting individuals of all ages. [5-1; 5-1]

314 (3) Management of the Neuromuscular System – The assessment and treatment of common disorders of the neuromuscular system affecting individuals of all ages. [5-1; 1-2]

330 (9) Clinical Fieldwork – Six weeks during Term 2 and twelve weeks during the summer for observation and supervised participation in health care facilities and agencies throughout B.C.

411 (2) Selected Topics in Physical Therapy – The application of physical therapy management of selected conditions. [1-2; 0-0]

412 (4) Critical Care – The principles and practice of physical therapy management of the high-risk, unstable, critically-ill patient with special reference to the patient with cardiorespiratory dysfunction. [1-2; 1-2]

413 (6) Comprehensive Patient Management – A problem solving approach to the comprehensive management of physical impairment, disability and maintenance of fitness of the child and adult. [0-0; 6-0]

414 (0) Social and Professional Issues – The political, social, and cultural issues in the development of physical therapy as a profession. [0-0; 1-0]

415 (1-3) Independent Study – Content to be determined and credit value assigned in consultation with a faculty member.

419 (3) Exercise Physiology in Health and Disease – The response, control and adaptation of the human body to exercise. Nutrition, energy transfer, systemic and cellular response to exercise, and concepts of testing and training with special reference to different patient populations. [3-0; 0-0]

430 (6) Clinical Fieldwork – Four weeks during Term 1 and eight weeks during Term 2 for observation and supervised participation in institutional and community health care settings throughout B.C. (or elsewhere in Canada - Term 2 only).

441 (1) A Manual Therapy Approach to the Assessment and Treatment of Individuals with Musculoskeletal Dysfunctions of the Lumbar Spine and Pelvis – An introduction to the field of manual physical therapy as applied to musculoskeletal dysfunction in the lumbar spine and pelvis. [0-0; 0-2]

442 (1) Spinal Cord Injury: Issues of Rehabilitation – A comprehensive overview of the physiotherapy management of persons with disabilities resulting from a spinal cord injury. [0-0; 1-0]

443 (1) Sports Physical Therapy – An introduction to the prevention, evaluation and rehabilitation of common sports

injuries. Lectures and practical sessions will emphasize “on-site” emergency management of athletes, as well as ongoing clinical concerns related to sports physical therapy. [0-0; 5-1]

445 (1) The Management of Children with Developmental Disabilities – Physical Therapy assessment and management of the child with a developmental disability. Emphasis on family involvement in goal-setting and treatment planning will be stressed. [0-0; 1-0]

**Religious Studies RELG
SEE ALSO COURSES UNDER ARABIC, HEBREW.**

100 (6) Religions of the World – An introduction to the major religions of the world (including Judaism, Christianity, Islam, Hinduism, and Buddhism), together with the concepts used in understanding religion. [3-0; 3-0]

202 (6) Myths, Legends and Scriptures of the Near East – An introduction to ancient Near Eastern mythology and to the Scriptures of Judaism, Christianity, and Islam. [3-0; 3-0]

204 (6) Introduction to Asian Religions – The religions of India, China, and Japan in their interactions and cultural contexts, including Hinduism, Buddhism, Jainism, Sikhism, Taoism, Confucianism, and Shinto. [3-0; 3-0]

205 (6) 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 (6) Archaeology of the Ancient Near East. – (Also listed as FINA 327.) [0-2; 0-2]

302 (3) Death and Afterlife in Western Religious Tradition – A survey of traditional attitudes toward death and beliefs regarding human existence after death in Western religions. [3-0]

304 (3) Creation and Covenant in Ancient Israel – A detailed literary-historical study of the Torah (Pentateuch) against the background of ancient Near Eastern creation myths. Students who have taken RELG 303 before 1994 cannot take this course. [2-1]

305 (3) Prophecy and Kingship in Ancient Israel – An examination of Israelite prophecy and prophetic writings in their historical context. Students who have taken RELG 303 before 1994 cannot take this course. [2-1]

306 (3) Archaeology and the Bible – The impact of archaeological research on understanding the history and religion of ancient Israel. [0-0; 0-2]

308 (6) Introduction to Jewish History – A detailed study of the history and beliefs of the Jews, from the Hellenistic period to contemporary North America. Includes an examination of Jewish teachings on selected issues, e.g. business and medical ethics, changing gender roles, political power. [3-0; 3-0]

309 (3) Jews and Christians – Aspects of Jewish-Christian relations from the beginnings of Christianity to the present day. Emphasis on the study of Christian and Jewish texts in translation. [3-0]

310 (3) Jewish Responses to Catastrophe – Topics include the destruction of the Second Temple, the Crusades, the expulsions from Spain and Portugal, and the Holocaust. A study of texts in translation. [3-0]

311 (3) Jewish Literature in Translation – A survey of Jewish literature in medieval and modern times. [3-0]

312 (3) Jews and Judaism in Canada – The history of the Jewish community in Canada, from New France to the present. Emphasis on the relationship between immigration and religious transformation, Jewish-Christian relations, the development of community structures. (Not offered every year.) [3-0]

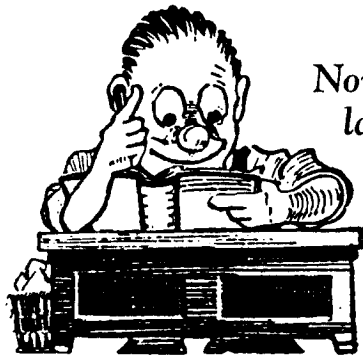
314 (6) The Origins of Christianity – The life and teachings of Jesus of Nazareth; the history, literature, and religion of the Christian communities to A.D. 150. [3-0; 3-0]

315 (6) History of Christian Thought – Selected topics with special emphasis on doctrinal change and development.

- orthodoxy and heresy, tradition and authority, and Church and State in the Patristic, Medieval, Reformation, and Modern periods. [3-0; 3-0]
- 320 (6) Medieval Latin – Introduction to Medieval Latin language and literature. Development of a reading knowledge of Medieval Latin through selections from major authors and genres after 400 A.D. Latin Major and Honours students require approval of the departmental adviser. (Same as LATN 305.) Prerequisite: LATN 200 or 300. [4-0; 4-0]
- 321 (6) Prophetic Figures in the Christian Tradition – Examined in their historical context and in terms of their continuing significance. Selection will vary from year to year, but may include Augustine, Thomas Aquinas, Martin Luther, and Teresa of Avila. [3-0; 3-0]
- 323 (6) Christianity in the Modern World – The interaction between Christianity and the major intellectual, social, and cultural developments since 1648 with special attention to the expansion of Christianity and its encounter with urban industrial society. [3-0; 3-0]
- 326 (6) Early Medieval Art – The transformation of Roman Imperial art into the medieval Christian arts of the Byzantine Empire and the Western European kingdoms, A.D. 100-1000. Offered in alternate years. (Also listed as FINA 331.) [2-1; 2-1]
- 327 (6) Architecture of the High Middle Ages – A study of the principal monasteries and cathedrals of Western Europe (ca. 1000-1300), with a view to understanding their technical, aesthetic, and theological dimensions as well as the role of contemporary institutions in their creation. Offered in alternate years. [2-1; 2-1]
- 328 (3) Medieval Philosophy – A survey of Western European thought, in its social and cultural setting, from Augustine to the twelfth century. Topics include: the interaction of Christianity and paganism; Augustine on the nature of man; Erigena and the Carolingian renaissance; Anselm; Abelard and the twelfth century renaissance. Primarily for students not specialising in Philosophy. (Also listed as PHIL 312.) [3-0; 0-0]
- 329 (3) Medieval Philosophy: B – Survey of Western European thought, in its social and cultural setting, from the twelfth to the fourteenth century. Topics include: the rediscovery of Aristotle; the influence of Islam; the rise of the universities; scholasticism: Bonaventure, Aquinas, Scotus; Ockham and after. Primarily for students not specialising in Philosophy. (Also listed as PHIL 313.) Prerequisite: PHIL 312 or permission of the instructor. [0-0; 3-0]
- 340 (6) Heritage of Islam – A detailed study of the history, beliefs, institutions, and literature of Islam. Not given every year. [3-0; 3-0]
- 341 (6) Islamic Art and Archaeology – A study of the artifacts of Islam as an expression of Islamic beliefs. (Also listed as FINA 359.) [0-2; 0-2]
- 354 (6) The Hindu Religious Tradition – Formation of Hinduism through the various periods of its history in interaction with indigenous movements and foreign religions. An overview of philosophical schools, religious doctrines, rituals, myths, and religious organizations. Same as ASIA 357. [3-0; 3-0]
- 364 (3) Buddhism in India and East Asia – The historical development and spread of Buddhism in its cultural contexts, from India and Central Asia to China, Korea, and Japan. Attention will be given to the whole scope of Buddhist beliefs and practices, including institutions, leadership, philosophy and popular devotion. [3-0; 0-0]
- 365 (3) Daoist (Taoist) Religion and Its Philosophical Background – A study of the Daoist religious traditions from their beginnings in the second century C.E. in cultural, intellectual and social contexts. Same as ASIA 365. [3-0; 0-0]
- 366 (3) Buddhism in China – History thought and practices of Chinese Buddhism from its beginnings until the twentieth century. Same as ASIA 366. [0-0; 3-0]
- 367 (5) Approaches to Zen – A critical examination of the historical and philosophical background of Zen, its contemporary situation, literary and artistic expressions, and recent developments. [2-1]
- 368 (3) Common Religious Traditions in China – A study of the religious practices and beliefs shared by the great majority of people in traditional Chinese culture, including ancestor worship, seasonal festivals, offerings to deities, exorcism of harmful forces. Same as ASIA 368. [0-0; 3-0]
- 370 (6) Concepts and Methods in the Study of Religion – Required of Major and Honours students in their third year. Open to others by permission of the instructor. [0-3; 0-3]
- 403 (3) Job and the Problem of Suffering – A seminar on the Book of Job and the history of its interpretation. [0-2]
- 407 (3) Topics in Early Judaism – Judaism and Hellenism, the rise of the synagogue, Jewish sects, the development of Mishnah and Talmud. Not offered every year. (Consult the Departmental brochure for the topic.) [0-2]
- 408 (3) Topics in Medieval Judaism – The work of Maimonides and other Jewish philosophers, early developments in Jewish mysticism, the Jews as a minority culture in Islamic and Christian lands. [0-0; 0-2]
- 409 (3) Topics in Modern Judaism – The Jews in the ghetto culture, Hasidism, the Emancipation, Reform, Orthodox, and Conservative Movements. [0-0; 0-2]
- 411 (3) The Gospels and the Historical Jesus [0-2; 0-0]
- 415 (3) The Life and Thought of Paul of Tarsus [0-0; 0-2]
- 420 (6) Religion in Canada – An examination of Canadian religious development with special reference to the separation of church and state, the rise of denominationalism and religious pluralism, secularization and ecumenicity, and the emergence of new religious movements. [3-0; 3-0]
- 448 (3) Seminar in the History of the Religion of Islam – A topic relevant to the study of Islam as a religion: e.g., the text and doctrines of the Qur'an; the Hadith (or Traditions) of the Prophet; Islamic Law; mysticism in Islam; the Shi'ah and the Isma'ilis. Not offered every year. (Consult the Departmental brochure for the topic to be offered.) [0-2]
- 449 (3) Seminar in the History of Muslim-Christian Relations – Topics in Muslim-Christian relations with special reference to the Middle Ages: e.g., the Crusades (with emphasis on the Muslim point of view); Muslim Spain (with special reference to Christians and Jews as subjects); attitudes of Christians and Muslims towards each other in their literature. Not offered every year. (Consult the Departmental brochure for the topic to be offered.) [0-2]
- 452 (6) Readings in Hindu Religious Texts – Representative texts, in translation, of the Vedic, Epic, Puranic, Classical, Medieval, and Modern periods. Emphasis in the second term on texts of particular periods, movements, or sects, depending on the students' needs and interests. Those with the necessary preparation may read some texts in the original languages. [3-0; 3-0]
- 475 (3/6) d Topics in Religion – Not offered every year. (Consult the Departmental brochure for the topic.)
- 479 (3/6) c Directed Studies – Reading and, where appropriate, other research on a topic arising in the discipline, arranged by agreement between the student and the instructor.
- 480 (3) Women and Religion – A study of the roles of women in the literature of one or more religious traditions. [3-0]
- 499 (6/12) c Honours Essay
- 500 (3/6) c Topics in Biblical Studies – Studies in the history, literature, canon and text, and the religious thought of the Old and New Testaments. This includes the study of the cultural and religious milieu out of which these documents arose. Such studies require a competence in the canonical languages (Biblical Hebrew and/or Koine Greek), usually achieved by not less than two year of study.

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- 502 (3/6) c Topics in Judaism – Studies in the texts (in translation), history, and religious thought of Judaism after the close of the Biblical Period.
- 503 (3/6) c Topics in the Post-Biblical Christian Tradition – Studies in post-Biblical history, documents, and religious ideas of the Christian tradition. Depending on the area of concentration, language requirements include either Latin or Greek and a reading knowledge of French or German.
- 510 (3/6) c Topics in Selected Areas of the Religious Texts an – Studies in texts, history, and religious thought of the Hindu or Buddhist tradition. Depending on the area of concentration, a competence is required in Sanskrit, Chinese, Japanese, or Tibetan, usually achieved by not less than two years of study.
- 511 (3/12) d Readings in Chinese Religious Texts – Selected readings from primary texts in Confucianism, Taoism, Buddhism, and popular religion. Prerequisite: Chinese 301 or equivalent. (Same course as ASIA 511.) [3-0; 3-0]
- 512 (3/6) c Topics in Buddhism – Specialized studies in texts, history, and religious thought of the Buddhist traditions. Depending on the area of concentration, language requirements include a knowledge of either Sanskrit, Chinese, Japanese, or Tibetan, usually achieved by not less than two years of study.
- 514 (3/6) c Topics in Islam – Studies in the literature (in translation), history, and religious thought of Islam in Western Asia and North Africa from its inception to the rise of the Ottoman Empire.
- 531 (6) Graduate Seminar
- 548 (0) Major Essay
- 549 (6/12) c Master's Thesis
- 631 (6/12) d Problems and Methods in Buddhist Studies – An examination of the primary religious, philosophical, and historical canonical literature of Buddhism and of the exegetical materials in Western and Eastern languages dealing with this literature. Attention will be focused on identification of religious problems and the methods employed to solve these in secondary sources.
- 649 Ph.D. Thesis

Religion and Literature RGLT
FACULTY OF ARTS

- 371 (3) Seminar in Religion and Literature. (0-3)
- 471 (3) Advanced Seminar in Religion and Literature. – Application of critical methods to one or more major authors. (0-3)

Resource Management and Environmental Studies RMES
FACULTY OF GRADUATE STUDIES

- 500 (3/12) d Resource and Environmental Workshop – Faculty and students from different disciplines act as an interdisciplinary team studying specific resource problems with ecological, economic, demographic and social dimensions. Techniques and methods of simulation are emphasized to show their value in integrating knowledge, defining policy and facilitating communication. Several sections with different emphasis offered each year. Prerequisite: permission of the instructor.
- 501 (3) Perspectives on Resources and Environment – Concepts of natural resources and environment; environment and resource management; tools of management; case studies.
- 502 (3) Seminar on Resources and Environment – Environment and resource management goals and issues. Students enrolled in the program will give two presentations. The first will outline specific research interests of the students. The second will provide a synopsis of research at a time when the student is nearing completion of the thesis. Faculty members and other speakers will also be invited to participate and present seminars.

- 599 (12) Master's Thesis
- 699 Ph.D. Thesis

Romance Studies RMST
DEPARTMENT OF HISPANIC AND ITALIAN STUDIES, FACULTY OF ARTS

- 420 (6) Studies in Romance Languages and Literature [3-0; 3-0]
- 478 (6) 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. Prerequisite: two years' study of each of two Romance languages or two years of one Romance language and one year of Latin. (Also listed as FREN 478 and LING 320.) [3-0; 3-0]
- 520 (6) Studies in Romance Languages and Literature
- 548 (0) Major Essay

Russian RUSS
SEE PROGRAMS IN THE FACULTY OF ARTS UNDER RUSSIAN AND SLAVIC LANGUAGES AND LITERATURES. SEE ALSO COURSES UNDER POLISH, UKRAINIAN AND SLAVIC STUDIES.

- 100 (6) First Year Russian – Introduction to contemporary Russian. Oral practice, grammar, reading, writing. [3-1; 3-1]
- 101 (3) Basic Russian I – Introduction to contemporary Russian with emphasis on technical vocabulary. Oral practice, grammar, reading and writing. Note: Students who intend to use Russian 101, 102 and 200 to satisfy the Faculty of Arts language requirement must register for both RUSS 101 and 102 in the same year. [3-1; 0-0]
- 102 (3) Basic Russian II – Continuation of RUSS 101. [0-0; 3-1]
- 200 (6) Second-Year Russian – Intermediate oral practice, grammar, reading, composition. A special section may be provided for Science students. Prerequisite: RUSS 100 or 102. [3-1; 3-1]
- 206 (3) Nineteenth-Century Russian Writers in Translation – The writings, lives, and thought of selected authors. [3-0; 0-0]
- 207 (3) Twentieth-Century Russian Writers in Translation – The writings, lives, and thought of selected authors. [0-0; 3-0]
- 215 (3) Russian Practice – Emphasis on oral practice and reading. It is recommended that this course be taken concurrently with RUSS 200, or the second term of RUSS 110. Prerequisite: RUSS 100 or the first term of RUSS 110. [0-0; 3-0]
- 300 (6) Third-Year Russian – Intermediate oral practice, syntax and composition. Prerequisite: RUSS 200 [3-0; 3-0]
- 305 (6) Readings in Russian Literary Texts – Texts are selected from 19th and 20th century sources. Prerequisite: RUSS 200. [3-0; 3-0]
- 306 (6) Russian Literature in Translation – A comprehensive historical and critical presentation with emphasis on the nineteenth and twentieth centuries. Not available for credit toward a Major or Honours program in Russian. Credit will not be given for both this course and RUSS 206-207. [3-0; 3-0]
- 315 (3) Advanced Russian Practice – Continuation of RUSS 215. May be taken concurrently with RUSS 300. Prerequisite: RUSS 215. [3-0]
- 400 (6) Fourth Year Russian – Advanced oral practice, reading and composition. Prerequisites: RUSS 300. [3-0; 3-0]
- 401 (6) Russian for Reading Knowledge – This course provides a reading knowledge of Russian, sufficient to enable students to understand scientific and scholarly material. Basic grammar and practice in the translation into English of texts in the natural sciences, social sciences, and humanities. Not available for credit towards a Major or Honours program in Russian. Intended primarily for upper-year and graduate students. [3-0; 3-0]

- 407 (3/6) d Studies in Russian Poetry – For further details see Department. Prerequisite: RUSS 300. [3-0] or [3-0; 3-0]
- 408 (3/6) d Studies in Russian Prose – For further details see Department. Prerequisite: RUSS 300. [3-0] or [3-0; 3-0]
- 409 (3/6) d Contemporary Russian Literature – See Department for further details. Prerequisite: RUSS 300. [3-0] or [3-0; 3-0]
- 410 (3/6) d Women and Gender in Russian Literature – Analysis of translated texts by and concerning women from folklore to contemporary society. Not available for credit toward Major or Honours Program in Russian. [3-0] or [3-0; 3-0]
- 411 (3/6) d Selected Russian Authors in Translation – See Department for details. Not available for credit toward a Major or Honours program in Russian. [3-0] or [3-0; 3-0]
- 449 (6) Honours Essay

Sanskrit SANS
SEE ASIAN STUDIES, SOUTH ASIAN LANGUAGES, FACULTY OF ARTS

Scandinavian SCAN
DEPARTMENT OF GERMANIC STUDIES, FACULTY OF ARTS

- 301 (6) Elementary Swedish – Introduction to the language. [3-0; 3-0]
- 401 (6) Intermediate Swedish – Advanced grammar, reading practice, and oral work. Prerequisite: SCAN 301 or equivalent. [3-0; 3-0]
- 410 (3) The Literatures of the Baltic in English Translation – An examination through literature of the historical, cultural, and ethnic elements that have made the Baltic area the crossroads of northeastern Europe. The emphasis is on literature from the Germanic and Finno-Ugric languages. Authors to be studied include Strindberg, Tikkänen, Tranströmer, Kaplinski, Grass, Bobrowski, Lenz. Not offered each year; consult the department. [3-0]
- 411 (3) Scandinavian Drama and Film in Translation – Traces the explosive development of a provincial theatre into one of the seminal forces of twentieth-century drama and film. Emphasis on Ibsen, Strindberg, and Bergman. Not offered each year; consult the department. [3-0]
- 412 (3) The Northern European Epic in Translation – Major prose works of the Scandinavian literatures with emphasis on the stylistic qualities of the Old Icelandic sagas and their transformation in the novels of modern Icelandic, Danish, Swedish, and Norwegian writers. Possible authors: Laxness, Blixen, Hamsun, Lindgren. Not offered each year; consult the department. [3-0]
- 501 (3/6) c Old Icelandic – Though 501 is usually taught as a six-credit course, students may elect to take the first term only, "Introduction to Old Icelandic," for 3 credits.

Science Education SCED
SEE CURRICULUM STUDIES, FACULTY OF EDUCATION

Science One
SEE FACULTY OF SCIENCE

Slavic Area Studies
SEE PROGRAMS IN THE FACULTY OF ARTS UNDER SLAVIC AREA STUDIES

Slavic Studies SLAV
DEPARTMENT OF RUSSIAN AND SLAVIC LANGUAGES AND LITERATURES, FACULTY OF ARTS

- 105 (6) Introduction to Russian and Slavic Culture – Cultural developments from the medieval period to the present. [3-0; 3-0]

307 (3/6) d Modern Slavic Literatures in Translation – An introduction to modern Czech, Polish, Slovak, South Slavic, and Ukrainian writers, with emphasis on the interaction between politics and literature.

South Asian Languages SOAL
SEE ASIAN STUDIES, FACULTY OF ARTS

Southeast Asian Languages SEAL
SEE ASIAN STUDIES, FACULTY OF ARTS

Social and Educational Studies SSED
SEE CURRICULUM STUDIES, FACULTY OF EDUCATION

Social Work SOWK
SCHOOL OF SOCIAL WORK, FACULTY OF ARTS

300 (6) Canadian Social Policy I – Historical review and analysis of Canadian social policy, social welfare programs and social work, including the constitutional, economic, legal, political, voluntary and governmental factors influencing their development and distributional impact. Enrolment is limited to students in the B.S.W. programs. [3-0; 3-0]

301 (3) Social Welfare in the Modern Era – An introduction to modern social welfare organization emphasizing the philosophy, growth and legislative developments of this significant item of public expenditure in industrialized societies. The focus is on the Canadian experience with some international comparison. Available for credit to students in the Faculty of Arts. [3-0; 0-0]

302 (3) Family and Child Welfare in the Modern Era – This course focuses on social services to families and children, a major activity within the broader social welfare field. Prerequisite: SOWK 301. Available for credit to students in the Faculty of Arts. [0-0; 3-0]

305 (6) Social Work Practice I – An examination of the foundation, knowledge and competencies underlying generalist social work practice. Enrolment is limited to students in the B.S.W. program. [3-0; 3-0]

315 (3) Practicum I – A supervised practicum in an assigned social service, two days a week throughout the program. Enrolment is limited to students in the B.S.W. program. This course will be graded Pass/Fail. [0-2-14; 0-2-14]

320 (3) Introduction to Social Work Research – Introduction to theory and conduct of social research as applied to social welfare and social work practice. The focus is on development of social work research questions and design of studies. Enrolment is limited to students in the B.S.W. programs, except by permission of the school.

335 (3) Fundamentals of Social Analysis for Social Work – An interdisciplinary approach to social analysis using theoretical perspectives from the social sciences and social philosophy. The course covers theories of society and of human nature, ideologies, value perspectives and approaches to special work practice using applied illustrations.

336 (3) Theoretical Foundations of Social Work I – Introduction to critical and systemic theories in social work with reference to individual development, families, small groups, social networks, organizations and social movements. [3-0]

337 (3) Theoretical Foundations of Social Work II – Analyses of selected theories in social work in one of the following interrelated areas: individual/family; small groups/social network organizations/social movements. Prerequisite: SOWK 336.

400 (3) Canadian Social Policy II – Analysis of race, gender, class and culture as factors in the distribution and delivery of Canadian social benefits and social services. [3-0]

405 (6) Social Work Practice II – This course examines the principles of optimal social work process with individuals, small groups, families and larger collectivities. [3-0; 3-0]

415 (3) Practicum II – A supervised practicum in an assigned social service, two days a week throughout the program year. Enrolment is limited to students in the B.S.W. program. This course will be graded Pass/Fail. [0-2-14; 0-2-14]

420 (3) Applied Social Work Research – An introduction to evaluation research in social work and other applied research methods. Design and execution of research project is required. Enrolment is limited to students in the B.S.W. program except by permission of the School. Prerequisite: SOWK 320.

425 (3) First Nations Social Issues – Contemporary social issues facing First Nations peoples and communities examined in the context of the history of Euro-Canadian/First Nations relations; the impact of Euro-Canadian institutions on First Nations Peoples; implication for social policy and social work practice. [3-0]

430 (3-6) d Special Studies in Social Work – Lectures, seminars and/or individual tutorials to develop knowledge and skills in relation to a defined theory, policy or practice problem or client population. Enrolment is limited to students in the B.S.W. program, except by permission of the School. [3-0] or [3-0; 3-0]

435 (3) Behavioural and Social Issues in Social Work Practicum – Examination of social, behavioural and life cycle issues of relevance to social work practice, including violence, alcoholism, depression, homelessness, death and environmental quality. Prerequisite: SOWK 335, 336 and 337.

440 (3-9) d Integrative Seminars in Social Work – A series of seminars offered during the final term of studies which address salient issues in social policy and social work practice and draw upon combined knowledge from social work and related disciplines.

501 (3/6) d Theoretical Foundations of Social Work

502 (3/6) d Theories of Canadian and International Social Development

503 (3/6) d Theoretical Foundations of Social Work in the Health Field

504 (3/6) d Feminism and Social Work Praxis

527 (3/6) d Family Mediation and Conflict Resolution

528 (3/6) d Cross-Cultural Social Work Practice

530 (3/6) d Social Services Management – Processes and techniques used to design and administer social service programs including methodologies to improve their organization, co-ordination and delivery; and drawing upon systems concepts, and concepts from various theories of organizational behaviour, decision-making, planning and communications.

540 (3) Comparative Theories of Social Work Practice – Selective and/or comparative study of intervention theories and related practice.

541 (3/6) d Social Work Practice with the Family – Comparative analyses of social work practice methodologies for the study and treatment of the family. Prerequisite: SOWK 410, or equivalent.

542 (3/6) d Social Work Practice with Individuals and Couples – Comparative analyses of social work methodologies for the study of intervention with individuals and couples. Prerequisite: SOWK 410, or equivalent.

543 (3/6) d Social Work Practice with Children – Comparative analyses of social work methodologies for the study of intervention with children. Prerequisite: SOWK 410, or equivalent.

544 (3/6) d Social Work Practice with Groups – Models of social work practice with groups. Prerequisite: SOWK 410, or equivalent.

545 (3/6) d Social Work Practice in the Community – Comparative analyses of theories and methodologies for social work practice, with particular emphasis on social planning and other forms of planned action, whereby individuals, groups, communities and organizations seek to influence

social policies and programs. Prerequisite: SOWK 415, or equivalent.

546 (3/6) d Methods for Popular Sector Organizing – The relationship of popular sector organizations to the Canadian state, their internal dynamics, objectives and strategies.

548 (3) Graduating Paper

549 (6/9) d Master's Thesis

551 (3/6) d Social Welfare Programs and Policies – Research Techniques – Concepts and skills of program and policy evaluation, as applied in social work practice. Detailed examination of alternative approaches to evaluation and to research utilization in social work. Design and execution of a research project is required. Prerequisite: SOWK 320, or equivalent.

552 (3/6) d Social Work Practice and Methodologies – Research – Concepts and skills of clinical evaluation, as applied in social work practice. Detailed examination of alternative approaches to evaluation and to research utilization in social work. Design and execution of a research project is required. Prerequisite: SOWK 320, or equivalent.

553 (3/6) d Quantitative Methods in Social Work Research – Topics will vary from year to year. Prerequisite: SOWK 551, or SOWK 552, or equivalent.

554 (3/6) d Qualitative Methods in Social Work Research – Topics will vary from year to year. Prerequisite: SOWK 551, or SOWK 552, or equivalent.

555 (3/6) d Seminar in Methodological Issues in Social Welfare Prerequisite: SOWK 551 or 552 or equivalent or permission of instructor.

556 (3/6) d Seminar in Social Welfare Theory Prerequisite: SOWK 521, 522, or 523 or the equivalent or permission of instructor.

557 (3/6) d Seminar in Social Work Practice Theory Prerequisite: SOWK 511, 512 or 513 or equivalent or permission of instructor.

560 (3/4-1/2) d Directed Field Studies in Social Work – Planned field work for learning and testing a mode or modes of intervention, related to the method specialization in the student's MSW program concentration.

570 (3/6) d Directed Studies in Social Work

571 (3/6) d International Social Development – Study of social policy issues in an international context.

572 (3/6) d Social Policy and Program Planning: Family and Child Welfare – Formulation and development of social welfare policies and programs; their bearing upon family life and the care and protection of children and the aged. Critical analyses of the validity, relevance and effectiveness of selected policies and programs.

573 (3/6) d Social Policy and Program Planning in the Health Field – Analysis and assessment of policies, programs and delivery systems in health services, with particular emphasis on inter-organizational and inter-professional arrangements and relationships and on health care financing and delivery in the context of comprehensive systems of social security.

574 (3/6) d Social Policy and Program Planning: Selected Fields – Analysis and assessment of methodologies in socio-economic policy formulation and related programming, with particular reference to the development of social security and social service in modern society, to the role of various professional and other interest groups and to the implications of policy options and alternative program designs. Topics will vary from year to year.

Sociology SOCI
DEPARTMENT OF ANTHROPOLOGY AND SOCIOLOGY, FACULTY OF ARTS

SOCI 100, 201, 210, 213, 214, 215, 240, 250, 260, 300, 301, 315, 352, 425, 465 AND 466 do not have prerequisites. For all other courses in Sociology note the prerequisites listed after the description of each course.

- SOCI 100 or 300 is prerequisite to all other third- and fourth-year courses, unless permission of the instructor is obtained.
- 100 (6) Introduction to Sociology – Introduction to problems in the analysis of social structures and processes. Basic sociological concepts will be introduced and their application demonstrated in various areas of sociology. The course includes a survey of research methods, major theoretical trends, and representative works of contributors to sociology. [3-0; 3-0]
- 201 (3/6) d Ethnic Relations – An introduction to the study of the relations between ethnic groups and of the interplay between ethnicity and other social factors. The course examines such concepts as: ethnicity, racism, prejudice, discrimination, assimilation, and multiculturalism. Ordinarily the course deals with ethnic groups in British Columbia, and students are expected to carry out elementary research projects. (Same course as ANTH 201.)
- 210 (3/6) d Canadian Social Structure – Descriptive and analytic survey of such features as demographic characteristics, class structure, ethnicity, and regional variation in Canadian society as a basis for understanding current social issues. [3-0] or [3-0]
- 213 (3/6) d Women in Comparative Perspective – An exploration of topics from Anthropology or Sociology focusing on explanations, in current and historical perspective, for variations in the situation of women. (Same course as ANTH 213.) [3-0] or [3-0; 3-0]
- 214 (3/6) d The Family in Cross-Cultural Perspective – A cross-cultural comparison of family and kinship to provide an understanding of variations in the structure and meaning of marriage relations; forms of domestic organization; and the sexual division of labour, property, and inheritance. (Same course as ANTH 214.) [3-0] or [3-0; 3-0]
- 215 (3/6) d Introduction to Japanese Society – Survey of contemporary Japanese life, with a focus on social organization and cultural patterns. Topics may include family, kinship, rural and urban conditions, economic organization, class and other inequalities, ethnic relations, and introduction of Western culture and value systems. (Same course as ANTH 215.) [3-0] or [3-0; 3-0]
- 240 (3/6) d Introduction to Social Interaction – A general introduction to research on social interaction, with an emphasis on group (as opposed to individual) processes and behaviour. Topics include: status, power and prestige, distributive justice, marginality and social control, authority relations, and group structure and membership, all to be studied in the context of a variety of groups (such as families, formal organizations, communities and friendship groups) and cultures. [3-0] or [3-0; 3-0]
- 250 (3/6) d Crime and Society – Crime as a social phenomenon, with emphasis on the changing definitions of crime in relation to social and political change in Canadian and other societies. The scope and nature of the crime problem, the growth of criminology as a science and profession, and relationships between components of state criminal justice systems. [3-0] or [3-0; 3-0]
- 260 (3/6) d Technology, Work and Society – The social forces responsible for changing patterns of technological innovation and work organization in modern industrial societies. Emphasis on the organization of work and the labour force. Topics may include division of labour, professionalization, labour movements, management techniques and bureaucracy, the social context of research and development initiatives, the effects of new technologies (e.g., automation) on the work place and social aspects of technological development in the Third World. [3-0] or [3-0; 3-0]
- 300 (6) Principles of Social Organization – The scope of this course is similar to that of Sociology 100, but it deals with fewer topics in greater depth. They may include, for example, socialization, stratification, leadership, deviance, social control, conformity, obedience to authority, legitimation of norms, as well as research methods and theoretical trends. Prerequisite: Third-year or fourth-year standing. Credit may be obtained for only one of SOCI 100 or 300. [3-0; 3-0]
- 301 (3/6) d Sociology of Development and Underdevelopment – Processes of social change in the Third World and other developing countries. Major themes stress the relationship between urbanization and industrialization; modernization and ethnic conflict; imperialism, neo-colonialism, and foreign aid; and intra-national modernization problems such as regional underdevelopment in industrial societies. [3-0] or [3-0; 3-0]
- 302 (3/6) d Ethnic and Racial Inequality – A critical examination of classical and contemporary theories and research evidence concerning ethnic and racial inequality at the societal and interpersonal levels. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 310 (6) Canadian Society – Examination of selected features of the social organization of Canadian society which will include, for example, the relationships between industrial organization, and other social institutions and processes, such as family structure, welfare systems, crime rates, ethnic relations and industrial and political conflict. Prerequisite: SOCI 100 or 300. [3-0; 3-0]
- 312 (3/6) d Gender Relations – The nature of gender relations, their social and cultural expression, and theories of gender inequality drawn from anthropological or sociological research. (Same course as ANTH 312.) Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 315 (3/6) d Japanese Culture and Society – An intensive examination of modern industrial Japan, including such topics as: demographic characteristics, class structure and inequality, industrial organization, political structure and conflict, ethnic relations, value systems, urban and rural traditions and cultural background of current events. Major theories of Japanese culture and economic development will be studied. (Same course as ANTH 315.) [3-0] or [3-0; 3-0]
- 328 (3/6) d Sociological Data Analysis – The testing of sociological theories using quantitative data analysis techniques. Students will use microcomputer programs on numerical data from social surveys, experiments, and official statistics. Prerequisites: STAT 203, and either SOCI 100 or 300.
- 330 (3/6) d The Study of Population – Basic concepts, techniques, and theories in the analysis of population structure, change, and problems. [3-0] or [3-0; 3-0]
- 350 (6) Theoretical and Methodological Problems in Sociology – Sociological theories and their relationship to methodological issues in the discipline. The course examines procedures by which sociological explanations are made, problems of objectivity in sociology, and current topics in sociological theory. Prerequisite: SOCI 100 or 300. [3-0; 3-0]
- 352 (3/6) d Organization of Work – The meaning of work and leisure. Properties of work organization: division of labour and specialization; technology and working knowledge; means of coordinating work, such as cooperation, authority, and exchange. Research problems concerning work in households, offices, and industry, division of labour by gender, industrial democracy and the relation of work and social inequality. [3-0] or [3-0; 3-0]
- 354 (3/6) d Community Studies – Study of the organization of human communities; a focus upon collective activities including family, work, neighbourhood, and formal and informal networks. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 360 (3/6) d Sociology and Natural Resources – Sociological perspectives on property, resource development, resource communities, and resource industries. Social causes and consequences of changes in the social organization (e.g., ownership and the labour force); and social policies (e.g., land use, property rights) in industries such as agriculture, fishing, forestry and mining. The course may also include examination of social aspects of resource development in the Third World. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 361 (3/6) Social Inequality – Tendencies toward equality and inequality; manifestations of inequality (occupation, education, gender, ethnicity, income, power) and their consequences; caste and class features of major stratification systems; theories of social class; stratification profile of contemporary industrial societies. Prerequisite: SOCI 100 or 300. [3-0; 3-0]
- 368 (3/6) d Deviance and Social Control – An analytic framework for the study of the generation and control of deviant activities, with particular emphasis on societal processes directed to the recognition and organizational treatment of 'deviants' as a phenomenon. The course stresses theoretical issues rather than social problems and their remedy. Prerequisite: SOCI 100 or 300. (3-0) or [3-0; 3-0]
- 380 (3) Introduction to Social Survey Design and Analysis – Questionnaire design, interviewing, sampling, and analysis of survey data. Prerequisite: SOCI 100 or 300. [2-1]
- 381 (3) Experimental Research in Sociology – The nature of experimentation. Various types of experimental design and of laboratory and field techniques. The advantages and limitations of experiments in sociological research. Some ethical questions regarding experimentation. Prerequisite: SOCI 100 or 300. [2-1]
- 382 (3) Socio-Ethnographic Research Methods in Sociology – Methods for studying the procedures by which people in everyday life achieve accountable results. Prerequisite: SOCI 100 or 300. [3-0]
- 383 (3) Methods of Historical and Comparative Analysis in Sociology – Methodological problems and research strategies associated with comparative cross-societal analysis and the interpretation of socio-historical data; contributions of classical and contemporary approaches to comparative analysis and social history. Prerequisite: SOCI 100 or 300. [3-0]
- 400 (3/6) d Theoretical Issues – Issues central to the history, development and evaluation of sociological thought from various perspectives. Prerequisite: SOCI 100 or 300. [3-0; 3-0]
- 410 (3/6) d Special Studies in Canadian Society – Selected areas of study relating to Canadian society such as B.C. Studies; French Canada's demographic problems; rural communities; social welfare and community programs in Canada. Consult the department for this year's offerings. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 411 (3) Applied Sociology – The application of sociology by individuals, groups, or organizations for purposes of understanding, management and control, and identifying reactions to both proposed changes and consequences of change. Prerequisite: SOCI 100 or 300. [3-0]
- 413 (3/6) d Family and Kinship – A cross-cultural survey of ways of defining family relationships and kinship organizations, including theoretical analysis as well as case studies. (Same course as ANTH 413.) Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 414 (3/6) d Feminist Theory – The emergence of feminist theory, its relationship to sociology, and the major theoretical schools of thought. The social basis and development of feminist thought from critiques of scholarship and research to contemporary debates will be addressed. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 416 (3/6) d The Ethnography of Japan – Through an analysis of contemporary ethnographic accounts of Japan, this course addresses the interplay of cultural predispositions with modern organizational structure, differences in rural/urban lifestyles, family relationships, gender roles, health, aging and Japan's international role. (Same course as Anthropology 416.) Prerequisite: One of the following: ANTH 215, SOCI 215, ANTH 315, SOCI 315, or permission of instructor. [3-0] or [3-0; 3-0]
- 418 (3/6) d Social Statistics – Primary emphasis on applications of statistical techniques to quantitative and qualitative

- 420 (3/6) d Sociology of the Environment – Sociological approaches to the study of environmental conflicts, issues, movements, impact of changing technology, economic development on the environment. Prerequisite: SOCI 100 or 300. [3-0; 3-0]
- 425 (3/6) d Urban Sociology – Demographic, behavioural, and organizational aspects of urban structures and of urbanization in different societies and periods. [3-0; 3-0]
- 433 (3/6) d Directed Studies – General reading and/or a research undertaking, with the agreement, and under the supervision, of a Department faculty member selected by the student. Prerequisite: SOCI 100 or 300.
- 449 (12) Honours Tutorial – Requires the presentation of at least one research paper.
- 460 (3/6) d Sociology of Special Geographical Areas – The description of areas to be covered will be announced each year. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 461 (3/6) d Political Sociology – The social and economic bases of political power. May include studies of the state and inter-state relations, ideology and control, alienation and anomie, political movements and social revolutions, political violence and terrorism, and the political economy of world conflict. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 462 (3/6) d Social Change – The interrelationships between modernization, political thought, and social structure; comparative survey of current trends in the institutional foundations of organized human activities; theories of social change. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 464 (3/6) d Social Movements – A study of the sources, stages, and effects of social movements in developing and modernized societies. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 465 (3/6) d Sociology of the Arts – An examination of the arts as social practices from the standpoint of the relationships among artists, critics, patrons, and public; and the social institutions through which these relationships are structured. [3-0; 3-0]
- 466 (3/6) d Socialization and Education – Study of induction into social structures and the acquisition of membership in society. Includes the structure and influence of educational and other socializing institutions. [3-0] or [3-0; 3-0]
- 470 (3/6) d Sociology of Crime and Justice – Critical examination of specific forms of crime and delinquency in relation to the criminal justice system including law, enforcement, and corrections. Issues selected for study will be further scrutinized within the cultural framework of ethics, morality, and social justice. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 473 (3/6) d Sociology of Mental Illness – A sociological approach to the meaning of mental illness; the organization of psychiatric treatment; problems in the explanation of the distribution of mental illness in a population. Prerequisite: SOCI 100 or 300. (3-0) or [3-0; 3-0]
- 475 (6) Interpersonal Relations – A self-analytic seminar for the study of group interaction and social conflict processes; interdisciplinary reading materials and assignments complement analysis of ongoing group and individual behaviour. Prerequisite: SOCI 100 or 300. [3-0; 3-0]
- 481 (3/6) d Interaction in Small Groups – Analysis and discussion of small group research (laboratory and field studies, experimental and non-experimental work). Topics include status, leadership, group cohesiveness, coalition formation, inter-personal evaluations, and reactions to deviant behaviour. Prerequisites: SOCI 381, and either SOCI 100 or 300. [2-1] or [2-1; 2-1]
- 484 (3/6) d Sociology of Health and Illness – Sociological perspectives on health, illness, and health care as represented in classic and contemporary sociological studies of selected topics such as illness experience, social aspects of the practice of health professionals, training of health professionals, and the social organization of health delivery systems. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 495 (3/6) d Advanced Studies in Sociology – An intensive examination of selected topics in Sociology. Consult the department for this year's offerings. Prerequisite: SOCI 100 or 300. [3-0] or [3-0; 3-0]
- 501 (3) Foundations of Sociological Thought – A critical survey of classical sociological thought and the theoretical works which have shaped the discipline of sociology.
- 502 (3) Contemporary Sociological Theory – Theoretical trends, issues, and perspectives in contemporary sociology, including problems of theory formation and the relation of theory and research.
- 503 (3) Methodology of Sociological Inquiry – The nature of sociological understanding and explanation, including a critical review of issues in the theory of methods.
- 504 (3) Research Design and Techniques – Sociological research design and the analysis and interpretation of data.
- 505 (3/6) c Tutorial in Sociological Theory Prerequisites: SOCI 501 and 502.
- 506 (3/6) c Tutorial in Research Methods Prerequisites: SOCI 503 and 504.
- 510 (3/6) d Seminar in Population, Community and Demography
- 515 (3/6) c Tutorial in Population, Community and Demography Prerequisite: SOCI 510.
- 520 (3/6) d Seminar in Crime, Law and Social Control
- 525 (3/6) c Tutorial in Crime, Law and Social Control Prerequisite: SOCI 520.
- 530 (3/6) d Seminar in Social Change and Development
- 535 (3/6) c Tutorial in Social Change and Development Prerequisite: SOCI 530.
- 540 (3/6) d Seminar in Social Inequality
- 545 (3/6) c Tutorial in Social Inequality Prerequisite: SOCI 540.
- 549 (6/12) c Master's Thesis
- 550 (3/6) d Seminar in Social Interaction
- 555 (3/6) c Tutorial in Social Interaction Prerequisite: SOCI 550.
- 560 (3/6) d Seminar in the Sociology of Culture and Knowledge
- 565 (3/6) c Tutorial in the Sociology of Culture and Knowledge Prerequisite: SOCI 560.
- 570 (3/6) d Seminar in Work, Industry and Technology
- 575 (3/6) c Tutorial in Work, Industry and Technology Prerequisite: SOCI 570.
- 580 (3/6) d Seminar in Canadian Society
- 585 (3/6) c Tutorial in Canadian Society Prerequisite: SOCI 580.
- 590 (3/6) d Seminar in an Ethnographic Area
- 595 (3/6) c Tutorial in an Ethnographic Area Prerequisite: SOCI 590.
- 596 (3/6) d Seminar in Political Sociology and Social Movements
- 597 (3/6) c Tutorial in Political Sociology and Social Movements Prerequisite: SOCI 596.
- 598 (3/6) c Directed Studies
- 599 (3/6) d Special Topics Seminar
- 649 Ph.D. Thesis

Soil Science SOIL

FACULTY OF AGRICULTURAL SCIENCES

- Admission to undergraduate courses numbered 303 or higher requires previous credit for SOIL 200 or consent of instructor.
- 200 (3) Introduction to Soil Science – Physical, chemical and biological properties of soils; soil formation, classification, use and conservation. Prerequisites: physics, chemistry and biology at Grade 12 or first-year university level. [3-2; 0-0] and [0-0; 3-2]
- 204 (3) Forest and Agricultural Climatology – An introduction to the basic principles and processes of climatology. Energy and water balance concepts. Atmospheric motion. Microclimate of soils, crops, forests and animals. Microclimate modification and air pollution. Climate classification and land capability. Same as GEOG 204. [3-2; 0-0; 0-0]
- 300 (3) Soil in the Human Environment – Soil as an element of the environment and as a basic resource. The composition and properties of soil in relation to resource management and sustainability. This course is intended primarily for students in faculties other than Agricultural Sciences and Forestry. Credit will be given for only one of SOIL 200 or 300. [3-2; 0-0]
- 304 (3) Soil Chemistry – Principles of soil colloid and solution chemistry; nature and laboratory characterization of soil minerals and organic matter. Chemical aspects of natural processes in the soil and reactions with soil environmental contaminants. Prerequisites: CHEM 201, 205 or 208 and consent of instructor. [3-2; 0-0]
- 308 (3) Quaternary and Applied Geomorphology – Landscape development during Quaternary era, emphasizing the history of glaciations with special reference to western North America; applications of geomorphological information in resource development and land management, emphasizing interpretation of Quaternary materials. Students will be required to attend weekend field trips. Prerequisites: SOIL 200; and GEOG 213 or GEOL 351, or permission of the Head of the Department. (Same as GEOG 308.) [0-0; 3-2]
- 313 (3) Soil Physics – Application of physical principles to the soil system including description of constituents and structure; flow and retention of water, heat and chemicals in soil; evaluation of soil strength. Prerequisite: MATH 101, PHYS 110 or 115 or 120. [3-2; 0-0]
- 314 (3) Biometeorology – The physical processes determining the microclimate of soils, forests and agricultural crops. Topics include radiation, heat and water relations, diffusion and turbulent exchange of matter and the modification of the microclimate. Instrumentation and field measurement. [0-0; 3-2]
- 321 (3) Soil Biology – The diversity of soil organisms (bacteria, protozoa, fungi, animals, plants) in natural and disturbed ecosystems; roles in primary production, nutrient cycling, decomposition and reclamation; interactions with other soil organisms and plants; responses to change of the physical and chemical environment. Prerequisites: BIOL 101, 102 or 103. [2-3; 0-0]
- 400 (3) Microbial Ecology – Ecological and environmental significance of metabolic and structural diversity in microbes; the effects of microbial activities in nature. Interactions among microbes in soil, freshwater and oceanic environments; interactions with plants, animals. Metabolic basis for applied uses of environmental bacteria in areas such as bioremediation, soil fertility and waste management. Prerequisites: MICB 200 or 417, and BIOL 201. (This course is the same as BIOL 400 and MICB 400.) [3-0; 0-0]
- 401 (3) Microbial Ecology and Diversity Laboratory – The use of enrichment and selection techniques to isolate a variety of bacteria from soil and aquatic environments. The range of isolates examined includes several types each of nitrogen-fixing bacteria, photosynthetic bacteria, anaerobes,

- lactic acid bacteria, xenobiotic-degrading bacteria, plant pathogens and bacteria that transform minerals. Prerequisites: MICB 200 or 417 and BIOL 201. Corequisite: SOIL 400. (This is the same as BIOL 400 and MICB 400.)
- 403 (3) Forest Soils – Forest soil properties, processes, and fertility; forest soils in relation to resource management. (Also offered as FRST 312.) [3-2; 0-0]
- 415 (3) Soil Fertility – Principles underlying soil management practices including nutrient supply, fertilizers and soil amendments; experimental methods and soil analysis. International and Canadian applications in crop production, environmental quality and reclamation. [0-0; 3-2]
- 416 (3) Pedology – Soil as a natural integration of the biophysical environment; weathering, soil formation, identification, classification and distribution of major soils. [0-0; 3-2]
- 417 (3) Land Information Systems – Philosophy and methods of data collection, analysis and classification of land for multiple uses. Laboratories emphasize geographic information systems applications. (This course is the same as FRST 422.) [0-0; 2-4]
- 422 (3) Root Symbioses – Interactions between plant roots and soil microorganisms with emphasis on mutualism. Topics include mycorrhizae, nitrogen-fixing nodules of legumes and non-legumes, and rhizosphere associations. Prerequisite: SOIL 321 or permission of instructor. (Offered in alternate years.) [0-0; 2-3]
- 423 (2) Undergraduate Seminar
- 430 (2-6) c Directed Studies – Systematic work on approved problem.
- 433 (3) Soil and Water Conservation – Soil management for environmental problem-solving. Topics include erosion control, water conservation, behaviour and degradation of organic contaminants, sorption and transport of inorganic contaminants, remediation of contaminated soils. Prerequisites: SOIL 304, 313 and 321. [0-0; 3-2]
- 435 (3) Soil Contamination and Remediation – Critical review of recent literature and case studies on soil contamination problems, regulatory approaches, remediation standards, and the nature, effectiveness and limitations of remediation methods. [0-0; 2-2]
- 442 (3) Photo Interpretation Forest Lands – Landform identification and terrain analysis from air photographs, application to forest and agricultural land mapping. This course is the same as FRST 442. [2-0-2; 0-0-0]
- 443 (3) Remote Sensing in Forestry and Agriculture – Basic biological concepts related to interpretation of remote sensing data for land management, including the use of films and filters, and interpretation of air photographs and other imagery. This course is the same as FRST 443. [2-0-2; 0-0-0]
- 498 (3) Undergraduate Essay – Preparation of a comprehensive and analytical review of an approved topic under the supervision of a faculty member. Prerequisite: Approval of the Head of the Department. Consult before the end of classes in third year.
- 499 (6) Undergraduate Thesis – Design and execution of an experimental/analytical research project leading to preparation of a thesis. Prerequisite: Approval of the Head of the Department. Consult before the end of classes in third year.
- 500 (2) Graduate Seminar
- 501 (2) Seminar in Soil Physics, Biometeorology, and Hydro – Current research in agricultural and forest hydrology. Emphasis is placed on graduate student research problems.
- 502 (2) Seminar in Soil Chemistry and Soil Fertility
- 503 (6) Forest Soils and Tree Nutrition Prerequisite: SOIL 403. Offered in alternate years.
- 504 (3/6) c Advanced Soil Chemistry – A study of research findings in specific phases of Soil Chemistry. (Offered in alternate years.)
- 512 (3/6) c Advanced Soil Biology – Current research in root-soil interfaces. Prerequisites: SOIL 321 or permission of instructor. (Offered in alternate years.)
- 513 (3/6) c Advanced Soil Physics – Infiltration and evaporation of water, flow and storage of heat and chemicals in soil, and interactions with the atmosphere. Emphasis on mathematical formulation of problems and solutions using analytical and numerical methods. Prerequisites: SOIL 313 and 314.
- 514 (3/6) c Biometeorology – Energy and mass exchange in the biosphere with emphasis on the interfaces between the atmosphere and soils, plants and animals. (Offered in alternate years.)
- 515 (3/6) c Topics in Soil Fertility – Discussions on special topics in soil fertility with emphasis on soil factors influencing nutrient availability and uptake. (Offered in alternate years.)
- 516 (3) Advanced Pedology – Soil as integrator of the biophysical environment, soil genesis and formation, biogeochemical cycles, approaches to soil systematics and classification systems. Prerequisites: SOIL 416 and consent of instructor. (Offered in alternate years.)
- 517 (3) Land and Resource Evaluation – Concepts and methods for multi-purpose land evaluations and assessing resource development options; monitoring and modelling environmental systems using GIS techniques. Prerequisite: SOIL 417 or FRST 422 or consent of instructor.
- 518 (3) Soil Clay Mineralogy – Minerals in soils and sediments; weathering, diagenesis and mineral cycles. Prerequisite: consent of instructor. (Offered in alternate years.)
- 524 (2) Instrumentation for Biometeorology – The theory, design and evaluation of instrumentation for biometeorological research. Consent of instructor.
- 525 (2) Techniques and Methods of Soil Chemistry and Ferti
- 530 (2-6) c Directed Studies
- 533 (3) Physical Processes in Soil and Water Conservation – The effects of tillage and mulching on soil thermal and moisture regimes. The control of soil degradation in agriculture and forestry.
- 549 (12) Master's Thesis
- 649 Ph D. Thesis

Spanish and Portuguese **SPAN**
DEPARTMENT OF HISPANIC AND ITALIAN
STUDIES, FACULTY OF ARTS

- 100 (6) Beginners' Spanish – Grammar, composition, translation, oral practice. [4-0; 4-0]
- 102 (6) First-Year Portuguese – Grammar, composition, translation, oral practice. [3-1; 3-1]
- 105 (12) Intensive Spanish – An accelerated course. Grammar, reading, composition, with special emphasis on the spoken language. This course is equivalent to SPAN 100 and 200. [4-3; 4-3]
- 110 (6) First-Year Spanish – Grammar, composition, translation, oral practice, readings. Prerequisite: C or P in Spanish 11 or pass-standing in SPAN 100. This course completes the Language Requirement for the Faculty of Arts. [3-1; 3-1]
- 200 (6) Second-Year Spanish – Grammar, composition, translation, oral practice, readings. Prerequisite: A or B in Spanish 11 or first- or second-class standing in SPAN 100. [4-0; 4-0]
- 202 (6) Second-Year Portuguese – Grammar, composition, translation, oral practice, readings. Prerequisite: PORT 102 or equivalent. [3-1; 3-1]
- 205 (6) Intermediate Spanish – Conversation, translation, and readings. Prerequisite: Spanish 12 or SPAN 110. Students with first- or second-class standing in SPAN 100 may take this course concurrently with SPAN 200. [3-0; 3-0]
- 220 (6) Introduction to Hispanic Literature – Basic techniques of literary analysis through the study of selected texts from the literatures of Spain and Spanish America. Prerequisite for the Major or Honours program. [3-0; 3-0]
- 300 (6) Spanish Language – Composition, translation, and oral practice. The course places special emphasis on pronunciation and syntax. [3-0; 3-0]
- 305 (6) Spanish Language – Intensive grammar study, translation, and reading of literary texts, for senior students with no previous knowledge of Spanish. Prerequisite: proficiency in another Romance language or Latin. [4-0; 4-0]
- 307 (6) Introduction to Portuguese for Senior Students – Intensive grammar study, translation, and reading of literary texts for senior students with no previous knowledge of Portuguese. Prerequisite: proficiency in another Romance language or Latin. [3-1; 3-1]
- 312 (6) Latin-American Literature in Translation – Introduction for the non-specialist to the major contemporary Latin-American literary works and their cultural background. Not available for credit toward a Major or Honours program in Spanish. [3-0; 3-0]
- 330 (6) Introduction to Hispanic Civilization – History and culture of the Hispanic world. Elements of Hispanic Civilizations and Languages. Their transmission to the New World. The emergence of independent Hispanic societies. The physical, social, and intellectual conditions of the Hispanic countries. [3-0; 3-0]
- 355 (6) Survey of Spanish Literature from 1700 to the Present [3-0; 3-0]
- 363 (6) Survey of Spanish-American Literature [3-0; 3-0]
- 392 (3/6) d Studies in Portuguese and Brazilian Literature [3-0] or [3-0; 3-0]
- 400 (6) Advanced Studies in Spanish Language and Style – Intensive training in translation and free composition, with special emphasis on the stylistic analysis of literary texts. [3-0; 3-0]
- 403 (6) History of the Spanish Language – The origins and development of Spanish; study of representative texts. The course will include an introduction to the history of Portuguese. [3-0; 3-0]
- 407 (3/6) d Special Aspects of Peninsular and Latin-American I. – A brief introduction to some problems of dialectology and/or to other Romance languages spoken in the Hispanic world. [3-0] or [3-0; 3-0]
- 427 (3/6) d Selected Topics in Medieval Literature – Study of medieval literature through the analysis of representative texts and authors. [3-0] or [3-0; 3-0]
- 435 (6) Survey of Spanish Literature from its Origins to 1700 Prerequisite: SPAN 300. [3-0; 3-0]
- 436 (3/6) d Cervantes and his Age – The writer and the background of his work and thought. [3-0] or [3-0; 3-0]
- 437 (3/6) d The Golden Age – Sixteenth- and seventeenth-century literature approached through the study of a genre: theatre, novel, poetry. [3-0] or [3-0; 3-0]
- 438 (3/6) d Selected Authors of the Golden Age – Study of the period through the analysis of representative authors' works. [3-0] or [3-0; 3-0]
- 444 (3/6) d Hispanic Language and Literature – Selected topics. [3-0] or [3-0; 3-0]
- 449 (6/12) c Honours Essay
- 457 (3/6) d Studies in Spanish Literary Genres from 1700 to the Present – Theatre, novel, poetry, essay. [3-0] or [3-0; 3-0]
- 458 (3/6) d Selected Topics of the Eighteenth, Nineteenth, and Twentieth Centuries in Spain – Literary periods and movements or individual authors. [3-0] or [3-0; 3-0]
- 464 (3/6) d Studies in Latin-American Literature [3-0] or [3-0; 3-0]

- 467 (3/6) d Studies in Spanish-American Literary Genres – Theatre, novel, poetry, essay, short story. [3-0] or [3-0; 3-0]
- 468 (3/6) d Selected Topics in Spanish-American Literature – Literary periods and movements or individual authors. [3-0] or [3-0; 3-0]
- 500 (0) Seminar in Hispanic Studies.
- 507 (3/6) d Studies in Hispanic Languages – Also lists as SPAN 508.
- 527 (3/6) d Selected Topics in Medieval Spanish Literature – Also lists as SPAN 528.
- 529 (3/6) d The Renaissance – Also lists as SPAN 530.
- 536 (3/6) d Studies in the Literature of the Golden Age – Also lists as SPAN 537 and 538.
- 543 (3/6) d General Studies in Hispanic Culture and Literature
- 544 (3/6) d The Regional Literatures of Spain
- 548 (0) Major Essay
- 549 (6/12) c Master's Thesis
- 550 (3/6) d Studies in Eighteenth-Century Literature – Also lists as SPAN 551.
- 553 (3/6) d Selected Topics in Nineteenth-Century Literature – Also lists as SPAN 554.
- 557 (3/6) d Selected Topics in Twentieth-Century Literature – Also lists as SPAN 558.
- 564 (3/6) d Studies in Latin-American Literature – Also lists as SPAN 565.
- 567 (3/6) d Topics in Twentieth-Century Latin-American Literature – Also lists as SPAN 568.
- 591 (3/6) d Studies in Luso-Brazilian Literature
- 649 Ph.D. Thesis
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- Statistics** **STAT**
FACULTY OF SCIENCE
- Statistics – Note: Introductory courses in probability and statistics are offered by many different departments at UBC. A list of these courses and details concerning restrictions on the number of credits students may obtain for such courses are provided under the heading Probability and Statistics in the Courses of Instruction of this Calendar.
- *For students in the Faculty of Applied Science.
- **Additional Fees are charged for these courses. See Index "Fees - Special Fees".
- 200 (3) Elementary Statistics for Applications – Classical, nonparametric and robust techniques for inferences about means, variances, and analysis of variance, with use of computers for statistical calculations. Emphasis will be on problem formulation, models and assumptions, and interpretation. Credit will be given for only one of STAT 105, 200 and 203. Prerequisite: MATH 101. [3-1; 0-0] or [0-0; 3-1]
- 203 (3) Statistical Methods – Organizing, displaying and summarizing data. Inductive inference based on elementary probability models including estimation and hypothesis testing. Not for credit in Faculty of Science. Credit will be given for only one of STAT 105, 200 and 203. Students who have taken MATH 100 are advised to take STAT 200 rather than STAT 203. Prerequisite: Mathematics 11. [3-1-0; 0-0-0] or [0-0-0; 3-1-0]
- 241 (3) Introductory Probability and Statistics – Probability models, distributions of random variables and vectors, statistical estimation and testing theory, topics from regression, analysis of variance, goodness of fit, quality control. Credit will be given for only one of STAT 205, 241 and 251. Prerequisite: MATH 200 or 253. [0-0; 3-1]
- 251* (3) Elementary Statistics – Probability, discrete and continuous random variables, joint probability distributions, point and interval estimation, hypothesis testing, additional topics from regression, analysis of variance, goodness of fit. Prerequisite: MATH 200 or 253. [3-1-0; 0-0-0] or [0-0-0; 3-1-0]
- 300 (3) Intermediate Statistics for Applications – Multi-factor analysis-of-variance and other experimental designs; multiple linear regression and regression diagnostics; analysis of covariance; categorical data and log-linear models; further topics in model fitting and data analysis, with statistical computing. Intended for students seeking additional exposure to statistical methodology, but not wishing to concentrate in statistical science. (Credit will be given for only of STAT 300, 306 and COMM 411.) Prerequisite: STAT 200. [3-1; 0-0] or [0-0; 3-1]
- 302 (3) Introduction to Probability – Basic notions of probability, random variables, expectation and conditional expectation, limit theorems. Prerequisites: MATH 200 or 226 (which may be taken concurrently if STAT 302 is being taken in the second term). MATH 302 and STAT 302 are the same. Credit will not be given for both MATH/STAT 205 and MATH/STAT 302. [3-0; 0-0] or [0-0; 3-0]
- 305 (3) Introduction to Statistical Inference – Review of probability theory. Sampling distribution theory, large sample theory and methods of estimation and hypothesis testing, including maximum likelihood estimation, likelihood ratio testing and confidence interval construction. Prerequisites: STAT 200 and MATH/STAT 302, or 65% in MATH/STAT 302. STAT 200 strongly recommended. [3-0; 0-0] or [0-0; 3-0]
- 306 (3) Applied Regression Analysis – Theory and application of regression analysis including residual analysis, diagnostics, transformations, model selection and checking, weighted least squares and nonlinear models. Additional topics may include inverse, robust, ridge and logistic regression. Prerequisites: STAT 200 and MATH 221. Corequisite: STAT 305. Credit will not be given for both STAT 300 and 306. [3-1; 0-0-0] or [0-0; 3-1]
- 335 (3) Statistics in Quality Assurance – Philosophy of quality improvement and total quality control. Definitions of quality. Deming's principles, Ishikawa's tools, control charts, acceptance sampling, continuous improvement, quality design. Credit cannot be obtained for both STAT 335 and WOOD 335. Prerequisite: STAT 200, or STAT 241 or 251. [3-1-0; 0-0-0] or [0-0-0; 3-1-0]
- 344 (3) Sample Surveys – Planning and practice of sample surveys. Random sampling, bias and variance, unequal probability sampling, systematic, multistage and stratified sampling, ratio and regression estimators, post-stratification, establishing a frame, pretesting, pilot studies, nonresponse and additional topics. Prerequisites: STAT 200 and MATH/STAT 302, or STAT 305. [3-1; 0-0] or [0-0; 3-1]
- 346 (3) Distribution Free and Robust Statistics – Techniques based on signs, counts, ranks and order statistics. Probability plots, permutation tests, rank tests, Hodges-Lehmann estimates, rank correlation, goodness-of-fit and independence, confidence and tolerance limits based on order statistics, additional topics. Prerequisites: STAT 200 and 305. [3-1; 0-0] or [0-0; 3-1]
- 398** (0) Co-operative Work Placement I – Work experience in an industrial research setting. Normally taken during Winter Session of third year. Restricted to students admitted to the Co-operative Education Program in Statistics. Prerequisite: Registration in Statistics Honours or Major Program.
- 399** (0) Co-operative Work Placement II – Work experience in an industrial research setting. Normally taken during Summer Session following third year. Restricted to students admitted to the Co-operative Education Program in Statistics. Prerequisite: STAT 398.
- 404 (3) Analysis of Variance – Theory and application of the analysis of variance for standard experimental designs. Single factor designs, fixed and random effects, block designs, hierarchical designs, multiple comparisons, Cochran's Theorem, factorial designs, mixed models, general rules for the analysis of balanced designs, analysis of covariance. Prerequisites: MATH 221 and STAT 305 and either STAT 200 or STAT 306. STAT 306 highly recommended. [3-1; 0-0] or [0-0; 3-1]
- 405 (3) Design of Experiments – Construction and analysis of experimental designs, 2k and 3k factorial designs, confounding, fractional replication, split-plot type designs, incomplete block designs, response surface designs, optimal design theory, special topics. Prerequisite: STAT 404. [0-0; 3-1]
- 406 (6) Statistical Inference – A detailed theoretical development. Likelihood, Bayes, minimax and conditional inference. Statistical models, exponential families, sufficiency, completeness, properties of estimators, optimal tests and confidence intervals, elements of decision theory, additional topics. Intended for Honours students. Prerequisite: MATH 321. STAT 305 strongly recommended. [3-0; 3-0]
- 441 (3) Multivariate Statistical Methods – Extensions of methods of estimation, testing hypotheses, analysis of variance and regression to multivariate data. Introduction to the exploratory and descriptive use of canonical correlations, principal components, factor analysis, discrimination and classification techniques and cluster analysis. Emphasis will be on computer implementation and applications to the various sciences. Prerequisite: STAT 404. [0-0; 3-1]
- 442 (3) Statistical Methods for Categorical Data – Exact and asymptotic methods for 2x2 and rxc contingency tables, logistic regression models for binary response variables, log-linear models for multiway contingency tables, model selection, special topics. Emphasis will be on computer implementation and applications to the various sciences and interpretation of the various models. Prerequisite: STAT 306. [3-1; 0-0] or [0-0; 3-1]
- 445 (3) Introduction to Exploratory Data Analysis – Methods for exploring and presenting the structure of data: one group of numbers, several groups, bivariate data, time series data and two-way tables. Data displays, outlier identification, transformations, resistant regression, several types of data smoothing, comparisons with standard statistical methods. Prerequisite: STAT 306. [3-1; 0-0] or [0-0; 3-1]
- 447 (2-6) c Special Topics in Statistics – Students should consult the Statistics Department for the particular topics offered in a given year. Prerequisite: STAT 305, and permission of the instructor.
- 450 (3) Case Studies in Statistics – Readings and projects in areas of current statistical application including environmental science, industrial statistics, official statistics, actuarial statistics, and medical statistics. Prerequisite: STAT 306. [3-1-0; 0-0-0] or [0-0-0; 3-1-0]
- 498** (0) Co-operative Work Placement III – Work experience in an industrial research setting. Normally taken during Summer Session following fourth year. Restricted to students admitted to the Co-operative Education Program in Statistics. Prerequisite: STAT 399.
- 499** (0) Co-operative Work Placement IV – Work experience in an industrial research setting. Normally taken during 1st term of Winter Session of fifth year. Restricted to students admitted to the Co-operative Education Program in Statistics. Prerequisite: STAT 498.
- 519 (6) Theoretical Statistics – Designed to prepare the student for specialized studies and research. Statistical decision problems, optimal decision rules, admissibility and completeness, Bayes and minimax procedures, characterization of sufficiency, structure of exponential families, unbiased and invariant estimators, most powerful tests, symmetry and invariance, asymptotic theory, special topics. Prerequisites: STAT 406 and either MATH 418/420 or MATH 544.
- 520 (2-6) d Topics in Bayesian Analysis and Decision Theory
- 521 (2-6) d Topics in Multivariate Analysis
- 522 (2-6) d Topics in Asymptotic Theory and Statistical Inference
- 526 (2-6) d Topics in Smoothing Methods

- 530 (3) Bayesian Inference and Decision – Utility functions and subjective probability distributions, uninformative priors, inference for common models such as the multivariate normal and regression models, hierarchical prior models, intersubjective statistical decision theory. Prerequisite: STAT 406.
- 531 (3) Reliability Theory – Probabilistic aspects of reliability theory. Classes of life distributions based on notions of aging, coherent systems, shock models, notions of dependence, multivariate distributions for dependent components, maintenance and replacement models. Prerequisites: MATH 303, 321 and STAT 305.
- 532 (3) Sequential Statistical Procedures – Sequential probability ratio test, fundamental identity, operating characteristics, optimality. Sequential tests for composite hypotheses. Sequential design of experiments. Bayes sequential decision problems, numerical methods. Applications to statistical problems. Prerequisites: MATH 419 and STAT 406.
- 533 (3) Survival Analysis – Basic concepts, special distributions, censoring. Parametric and nonparametric methods, product-limit estimator, log-rank test, goodness-of-fit. Models for dependence on explanatory variables, residual analysis, time dependent covariates. Prerequisites: STAT 306 and 406.
- 534 (3) Statistics for Quality and Productivity – Graphical methods including Ishikawa's methods and control charts. Taguchi's philosophy. Designing quality in acceptance sampling. Special topics. Prerequisite: STAT 405.
- 535 (3) Statistical Computing – Numerical methods useful for statistical research, and numerical analysis useful for writing statistical software (e.g. numerical linear algebra, optimization, generation of pseudo-random numbers, statistical graphics). The statistical language and computing environments for data analysis. Special research topics. Prerequisites: STAT 404, or broad exposure to statistics.
- 538 (3) Generalized Linear Models – Natural exponential families, moment generating functions, variance functions, dispersion models. The saddlepoint approximation, asymptotic theory, chi-square, F- and T-tests. Analysis of deviance, residual analysis, iterative least squares algorithm. Applications to positive, discrete, mixed, compositional and directional data. Special topics. Prerequisite: STAT 306 and 406.
- 541 (3) Applied Multivariate Analysis – Topics to be developed with motivation provided by examples from various sciences include: multivariate normal distribution, assessing multivariate normality, Hotelling's T^2 , multivariate analysis of variance and covariance, multivariate regression, discrimination and classification, cluster analysis, canonical correlation, principal components and factor analysis. Prerequisites: MATH 307 and STAT 404.
- 542 (3) Analysis of Categorical Data – A systematic treatment of the theory and use of log-linear and linear logistic models for categorical response variables. Poisson, multinomial and product-multinomial sampling models, maximum likelihood estimation, existence of direct estimates, computational algorithms, adjusted residuals, asymptotic inference, approaches to model selection, special topics. Prerequisite: STAT 404.
- 543 (3) Time Series Analysis – A systematic treatment of many of the techniques of the analysis of time series data. Topics include time dependence and randomness, trend, seasonality and error, stationarity, finite parameter models, Box-Jenkins techniques, spectral analysis, the Wiener-Kolmogorov approach, multivariate time series, cross-spectral analysis, "final form" type models and Kalman filtering. Prerequisite: Permission of instructor.
- 544 (3) Theory of Sampling – A comprehensive account of sampling theory as it has been developed for use in sample surveys. Topics include simple random sampling, stratified random sampling, ratio estimates, regression estimates, systematic sampling, cluster sampling, subsampling, double sampling, estimation of sample size, sources of errors in surveys.
- 545 (3) Data Analysis – Topics will include the philosophy of exploratory data analysis, indication and cross validation, displaying and summarizing data, residual plotting, transforming data, assessing uncertainty, the jackknife, multiway analysis, robustness, standardization, regression and curve fitting, the bootstrap and other computer-intensive methods. Prerequisite: STAT 404.
- 546 (3) Nonparametric Statistical Methods – Linear rank tests for one and two samples, sign test, rank sum test, normal scores test, Savage test. Rank tests for k samples and nonparametric regression. Permutation tests. Goodness-of-fit tests, Kolmogorov-Smirnov and Cramer-von Mises tests. Power and Prerequisite: STAT 406.
- 547 (2-6) c Topics in Statistics – Students should consult the Statistics Department for the particular advanced topics offered in a given year.
- 548 (2-6) c Directed Studies in Statistics – Advanced study under the direction of a faculty member may be arranged in special situations.
- 549 (6/12) c Thesis for Master's Degree
- 550 (3) Techniques of Statistical Consulting – The basic skills of statistical consulting. Analysis of data sets, modelling, and statistical computing. Special topics such as graphical methods and data reduction techniques. Readings on consulting and applying statistics. Prerequisite: STAT 405.
- 551 (3) Statistical Consulting – Supervised statistical practice directed toward the solution of current problems posed by subject-area researchers. Prerequisite: STAT 550.
- 649 Ph.D. Thesis

Surgery SURG FACULTY OF MEDICINE

See course listed below under Surgery, Cardiovascular and Thoracic Surgery, General Surgery, Neurosurgery, Otorhinolaryngology, Paediatric Surgery, Plastic Surgery, Radiation Oncology, Urology, and Vascular Surgery. Credit will not be given for both SURG 502 and 782, 504 and 784, 505, 548 and 788.

- 425 (4) Introduction to Surgery – A series of lectures designed to illustrate the basic surgical principles. Bedside clinics illustrating the principles of physical diagnosis are given in cooperation with the Department of Medicine. Students are given the opportunity to examine patients.
- 448 (2-6) c Directed Studies – A special elective program of directed studies in clinical or laboratory experimental science related to surgery. For students enrolled in the first or second year of the Faculty of Medicine.
- 450 (14) Principles of Surgery – During an eight week rotation, clinical teaching is provided to small groups of students, at the bedside on the wards and in outpatient settings. Surgical diagnosis and the recognition and appropriate initial investigation and treatment of life threatening injuries and illnesses are emphasized. Problem based seminars have taken the place of lectures. The teaching facilities of The Vancouver Hospital (12th and Oak and UBC sites), St. Paul's Hospital, B.C. Children's Hospital, B.C. Cancer Association Maxwell Evans Clinic and to a lesser extent some other regional hospitals are used. The scope of the teaching includes all the surgical subspecialties and is integrated with the Department of Orthopedics. Textbooks: Way, Current Surgical Diagnosis and Treatment; Sterns, Clinical Thinking in Surgery.
- 475 (18) Surgery – A 12-week clinical clerkship in surgery. Students, with departmental guidance, if requested, should select those surgical services which most closely meet their individual requirements, having in mind their undergraduate training and their career interests. In general surgery the clinical clerkship rotation is of four weeks' duration while rotations in anaesthesiology, cardiothoracic surgery, neurosurgery, ophthalmology, orthopaedics,

otorhinolaryngology, plastic surgery, paediatric surgery and urology are of two weeks' duration. During these periods the student is an integral part of these services, attends the outpatient and emergency departments and assists at operation in selected cases. In addition to Service Rounds and Seminars, there are other teaching activities within the department during this 12-week period. During the Elective period the student may rotate through surgical specialities that he has missed, or if he has decided on a career in any particular speciality, he may return to it for further study in depth. The minimal duration of a rotation during this elective period is four weeks.

- 500 (4) Experimental Surgery – Lectures and seminars dealing with the selected application of surgical techniques in biological investigation.
- 501 (4) Surgical Methodology in Research – Seminars with the laboratory preparation of advanced procedures used in modern physiological and surgical research. Courses 502 to 511 consist of a series of two-year courses common to all branches of surgery (core) plus lectures structured for selected major disciplines in surgery.
- 502* (2) Surgical Core – The scientific aspects of surgery common to all branches of surgery.
- 504* (4) Advanced General Surgery I – Fundamental concepts in general surgery. Given in alternate years.
- 505* (4) Advanced General Surgery II – The second year of the above program. Given in alternate years.
- 510 (2) Advanced Urology I – Selected topics in urology and related basic sciences. Given in alternate years.
- 511 (2) Advanced Urology II – The second year of the above program.
- 512 (2) Advanced Neurosurgery I – Selected topics in neurosurgery and the related basic sciences. Given in alternate years.
- 513 (2) Advanced Neurosurgery II – The second year of the above program. Given in alternate years.
- 514 (2) Advanced Plastic Surgery I – Seminar and tutorial on selected topics of plastic surgery. Given in alternate years.
- 515 (2) Advanced Plastic Surgery II – The second year course of the above program. Given in alternate years.
- 548* (2-4) c Seminar in Surgery
- 549 (6/12/18) c M.Sc. Thesis

Cardiovascular and Thoracic Surgery

- 710 Cardiac Surgery Seminar – Weekly one-hour seminars of cardiac diseases are presented with a view to selecting patients for surgery.
- 711 Thoracic Surgery – Stress is laid on basic physiology and pathology plus a review of topical literature. Two hours weekly.
- 712 Death and Complication Rounds – A review of all deaths and complications which have occurred during the preceding month following cardiothoracic surgery, involving analysis of the possible causative factors with emphasis on prevention in the future. Four hours monthly.
- 713 Cardiothoracic Surgery – The practice of surgery including the basic anatomy, basic technical surgery, cardiorespiratory pathology and pathophysiology, followed by early post-operative care, including intensive care technique.
- 778 B.C. Cancer Association Lung Cancer Conference – Neoplasia cases are presented and management discussed, including diagnosis, surgical and non-surgical treatment, and the management of recurrent cancer. One hour weekly.

General Surgery

- 700 Journal Conference – Residents meet with members of active staff three hours monthly to discuss recently-published surgical literature.

- 701 General Surgery Conference I – (One service per week). Presentation of clinical cases and problems. Discussion of management of the patient and pathophysiology. All active staff members on service attend. One hour weekly.
- 702 General Surgery Conference II - Grand Rounds – One hour per week. Presentation of cases, symposia, etc., with literature reviews emphasizing pathophysiology, and discussion of management of cases.
- 703 General Surgery – Residents and Staff discuss disease process and management at the bedside - each of four wards daily.
- 704 General Surgery – Two hours per week in two general surgery clinics and one hour per week in peripheral vascular and proctology clinics.
- 705 General Surgery – Practical operative application of general surgery. Anatomy, pathophysiology, surgical judgement, pre- and post-operative care, complications of the disease and surgery are stressed.
- 782* Surgical Core – The scientific aspects of surgery common to all branches of surgery.
- 784* Advanced General Surgery I – Fundamental concepts in general surgery. Given in alternate years.
- 785* Advanced General Surgery II – The second year of the above program. Given in alternate years.
- 788* Seminar in Surgery
- 903 Surgery Review – A thirty lecture-demonstration course in general surgery alternating with a similar series in speciality 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.

Neurosurgery

- 730 Correlative Clinical Neurosurgery Rounds – Residents meet with radiology, neuropathology, and active staff members for discussion of problem cases. One and one-half hours weekly.
- 731 Neurosurgery Conference – One three-hour session weekly with a member of the active staff, conducted at the bedside or in conference room. Cases reviewed with emphasis on the proper application of diagnostic methods and the indications for operative management.
- 732 Neuroradiology – Sessions conducted by members of the Department of Radiology in which case histories are reviewed and related to radiological investigation and interpretation. One hour weekly.
- 733 Anatomy and Neuropathology in the Brain – Sessions conducted by a neuropathologist, Department of Pathology. Attended weekly by neurosurgical resident staff. Two hours weekly.
- 734 Operative Neurosurgery – Technique of neurosurgical procedures. Anatomy, surgical judgement, pre- and post-operative care. From a general selection of neurosurgical procedures, approximately 950 major neurosurgical procedures per year are carried out under supervision.

Otorhinolaryngology

- 740 Otorhinolaryngology Rounds – Diagnostic problems of groups of patients with variations of a disease entity are presented and discussed by the residents, Otorhinolaryngology staff and invited specialists from other disciplines. One hour weekly.
- 741 Residents' Quiz – A one-hour quiz session with both basic science and clinical problems. A reading assignment is given one week prior to the quiz.
- 742 Residents' Seminar – A 30-minute paper is presented by one of the residents. This is followed by a 30-minute discussion between the residents and attending otorhinolaryngology staff. One hour weekly.
- 743 Basic Science Seminar – Consists of a series of basic science lectures given by members of the

otorhinolaryngology staff and members of the Medical School Faculty. These cover anatomy, physiology, pharmacology, and pathology of ear, nose and throat, and are held for two hours each week for four months.

- 744 Otorhinolaryngology Lecture Series – A basic course in clinical otorhinolaryngology given by members of the medical staff for two hours per week for eight months.
- 745 (i) Gross Anatomy Dissection – Consists of anatomical dissections of the head and neck by otorhinolaryngology residents, under supervision of otorhinolaryngology and anatomy Faculty. (ii) Surgical Anatomy - Anatomical dissection by the residents, with particular attention to otorhinolaryngological surgical procedures, supervised by otorhinolaryngology staff.
- 746 Otorhinolaryngology Conference – Twice per month. This consists of a series of lectures, primarily from related disciplines, providing instruction to the otorhinolaryngology residents and staff in general medical and surgical problems. The lecture period is one hour, followed by a one-hour period of discussion.
- 773 Otorhinolaryngology Operating Room – Techniques of surgical procedure are taught by otorhinolaryngology staff.
- 778 Ear, Nose and Throat Tumor Conference at the B.C. – New patients with tumours of the head and neck are presented to, and discussed by, the otorhinolaryngology residents and attending staff one hour weekly.

Paediatric Surgery

- 755 Paediatric Surgery – A clinically-oriented course with case presentations of surgical conditions particularly related to childhood. One hour weekly.
- 756 Paediatric Surgery Conference II – One member of attending staff discusses cases on bedside rounds for one hour weekly. Approaches to investigation and supportive care are stressed.
- 757 Paediatric Surgery – Residents learn operative skills, judgement and supportive measures as applied to surgery of children and neonates.
- 758 Advanced Pediatric Surgery – In-depth experience in all facets of paediatric and neonatal surgery for those who have made a career choice in the speciality, with particular reference to clinical decision making, specific operative techniques and post-operative care of paediatric patients.

Plastic Surgery

- 750 Plastic Surgery Conference – Presentation of clinical cases with discussion of the underlying pathophysiology as related to patient management. One hour weekly.
- 751 Plastic Surgery Seminar Course – A one-hour weekly seminar course spread over two years for discussion of embryology, anatomy, physiology and pathology relative to the speciality of plastic surgery. These basic science aspects are discussed in relation to patient management.
- 752 Plastic Surgery, Operating Room – Techniques of surgery and the relative anatomy and pathophysiology are discussed.

Radiation Oncology (BC Cancer Association)

- 770 Grand Rounds – Rounds are held each week and last one hour. They consist of presentations by residents of clinical cases, with history and physical findings. Residents in radiation oncology with other residents from the departments of medicine, surgery and gynaecology participate during periods of duties in the B.C. Cancer Association. General aspects of clinical oncology and management of patients are discussed critically with all staff in attendance.
- 772 Staff Seminars – A series of weekly presentations, each of one-hour duration, throughout the academic year. Invited outside speakers, as well as B.C. Cancer Association staff, cover a range of current cancer-related topics of broad interest, from basic science to clinical subjects.

- 773 Radiation Oncology – Residents are allocated to the service of one or two staff members on two-monthly rotations. On each service, they are personally supervised in ward management of patients and in addition, receive practical experience in the planning and execution of radiation treatments, using the gamut of radiation modalities.
- 774 Basic Science Lecture - Physics – This course spans 18 months. It occupies four hours of lectures each week in the evening plus one hour per week tutorial. In addition, practical laboratory experiments are undertaken. The course is supervised by the senior physicist.
- 775 Basic Science Lecture - (i) Radiobiology – A series of nine lectures of one hour each week, given in the second year of resident training, supervised by the Head of the Department of Biophysics. (ii) Tumour Pathology - A series of twelve weekly one hour lectures given by pathologists to the B.C. Cancer Association. These cover selected topics, augmenting clinical lectures.
- 776 Clinical Lectures – A series of didactic lectures spanning a two-year period. Lectures are of one hour duration, two per week, with emphasis on radiation oncology but also including chemotherapy and immunotherapy. Lectures are given by radiation and medical oncologists on staff. In addition, a series of "current concept reviews" is given by colleagues from the attending medical staff outside the discipline of radiation oncology.
- 778 Joint Interdisciplinary Oncology Clinical Conference – These clinical conferences are held throughout the course of each week by the permanent staff of the B.C. Cancer Association, in conjunction with members of the attending medical staff, with residents in attendance. Special conferences scheduled include: Sarcoma, Urology, Lymphoma, Gynaecology, ENT, GI, Lung, Skin and Breast, each of minimal duration of one hour. The format of these clinical presentations varies, some emphasizing evaluation of new and follow-up patients, others primarily comprehensive teaching clinical conferences illustrating selected aspects of malignancy in that site. The assessment of patients and the extent of disease, the selection of treatment method and management problems are fully discussed.

Urology

- 760 Urology Conference I – Presentation of clinical cases and subject reviews.
- 761 Urology Conference II – This is held at University Hospital Shaughnessy site and involves a review of clinical material and subject review. One hour weekly.
- 762 Urologic Radiology – Two hours per week spent on review of accumulated basics in radiology as well as current clinical material. This is supervised by urology and radiology staff members.
- 763 Paediatric Urology – Current clinical material review as well as subject review for two hours per month.
- 764 Urology Seminars – A weekly two-hour meeting with urology staff members on subject review and basic urology, physiology, and surgery.
- 765 Urologic Surgery – The application of urology with discussion of techniques of surgery, anatomy, pathology, pathophysiology and complications of diseases. Two hours weekly.
- 778 B.C. Cancer Association Rounds – Detailed discussion of urologic neoplasia with reference to management utilizing radiotherapy, chemotherapy, and general urology. One hour weekly.

Vascular Surgery

- 735 Vascular Surgery Rounds – Presentation of clinical cases by residents. Discussion of diagnosis, pathophysiology and management. Review of relevant scientific literature. One hour weekly.
- 736 Operative Vascular Surgery – The learning of operative skills, clinical judgement and supportive measures in the

surgical management of peripheral vascular disease and trauma to the vascular system.

- 737 Vascular Surgery Clinics – Residents and staff discuss cases of ambulatory and hospitalized patients. Pre-operative assessment, diagnosis and options of management are stressed.
- 738 Vascular Surgery Seminars – A systematic and in-depth study of vascular diseases in order to understand the pathophysiology of vascular diseases and the scientific basis of management. Two hours, once weekly from December to June.

Teacher Librarianship LIBE
SEE LANGUAGE EDUCATION, FACULTY OF EDUCATION

Technology Studies Education
SEE CURRICULUM STUDIES, FACULTY OF EDUCATION

Theatre THTR
DEPARTMENT OF THEATRE AND FILM, FACULTY OF ARTS

- 120 (6) Introduction to Theatre – Theory and practice of the theatrical arts; the development of Western theatre; reading of representative plays. The plays presented by the Frederic Wood Theatre during its Winter season will be studied in this course; students must obtain season tickets. [3-0; 3-0]
- 150 (6) Introduction to Technical Theatre – Foundation study of the technical aspects of theatre production. Participation in departmental productions required. [2-2; 2-2]
- 160 (6) Introduction to Acting – Open to all students on audition. [2-2; 2-2]
- 220 (6) Play-Interpretation and Production-Analysis – Basic methods of interpreting dramatic texts and analysing plays in performance. The plays presented by the Frederic Wood Theatre during its Winter season will be studied in this course; students must obtain season tickets. [3-0; 3-0]
- 250 (6) Technical Theatre 1A – The planning and execution of scenery, costumes, properties, lighting, and sound for the stage. Prerequisite: THTR 150; corequisite: THTR 251. [2-3; 2-3]
- 251 (6) Technical Theatre 1B – The operation and running of scenery, costumes, lighting, and sound for the stage. Participation in departmental productions is required. Prerequisite: THTR 150; corequisite: THTR 250. [2-3; 2-3]
- 260 (6) Acting – The Rehearsal Process – Textual analysis and performance of short scenes. Prerequisite: THTR 160. Audition required. The plays presented in the Frederic Wood Theatre during its Winter season will be studied in this course; students must obtain season tickets. Not open to B. [2-2; 2-2]
- 261 (6) Beginning B.F.A. Acting – A study of the actor's basic technique through improvisation and textual analysis. The plays presented by the Frederic Wood Theatre during its Winter season will be studied in this course; students must obtain season tickets. Prerequisite: THTR 160. Audition required. To be taken in conjunction with THTR 262. Open only to B.F.A. (Acting) students. [2-3; 2-3]
- 262 (6) Beginning Speech and Movement – Development of the student's awareness of the voice and body as communicative instruments, and the beginning of the technical control of both. To be taken in conjunction with THTR 261. Open only to B.F.A. (Acting) students. [2-2; 2-2]
- 263 (3) Voice and Speech – A course in voice-production, diction, and oral interpretation, designed to cultivate effective and expressive speech. Prerequisite: THTR 120 or 160 recommended. [2-2]
- 305 (6) Introduction to Design for the Theatre – The graphic skills and aesthetic principles involved in scenery and costume design. Prerequisite: permission of the instructor. [2-3; 2-3]
- 310 (6) History of the Theatre to 1700 [3-0; 3-0]
- 320 (6) History of Modern Theatre – The development of Western theatre since 1700, with emphasis upon the twentieth century. [3-0; 3-0]
- 325 (3/6) d History of Canadian Theatre [3-0] or [3-0; 3-0]
- 340 (6) History of the Oriental Theatre – Open to all students in third year and above. [3-0; 3-0]
- 345 (6) Theatrical Production – A survey of the practical aspects of theatre production. Not open to students with THTR 150 or 250. [2-2; 2-2]
- 350 (3) Scenery – Scenery construction, rigging, and systems. Prerequisite: permission of the instructor. [2-2; 0-0]
- 351 (3) Stage Lighting – The principles and history of the optical, distribution, and control systems used in stage lighting. Prerequisite: permission of the instructor. [2-2; 0-0]
- 352 (3) Scene Painting – Media, techniques, and textual treatments used in scene painting. Prerequisite: permission of the instructor. [2-2; 0-0]
- 353 (3) Costume – The construction and history of theatrical costume and accessories. Prerequisite: permission of the instructor. [2-2; 0-0]
- 354 (3) Stage Management – Principles and procedures of stage management: organizations, systems, and operations. Prerequisite: permission of the instructor. [2-2; 0-0]
- 360 (6) The Role: Interpretation and Characterization – Emphasis will be on externalizing the inner character in conjunction with work in textual analysis, improvisation and internal techniques. Prerequisite: THTR 260 and permission of the instructor. Not open to B.F.A. (Acting) students. [2-2; 2-2]
- 361 (6) Intermediate B.F.A. Acting – Character and styles in acting. Prerequisite: THTR 261 and 262. To be taken in conjunction with THTR 362 and 370. Open only to B.F.A. (Acting) students. [2-3; 2-3]
- 362 (6) Intermediate Speech and Movement – The course is designed to develop the student's awareness of the expressive qualities of the voice and body and to begin learning techniques of control. Prerequisite: THTR 261 and 262. This course must be taken in conjunction with THTR 361 and 370. Open only to B.F.A. (Acting) students. [1-4; 1-4]
- 370 (6) Tutorial in Acting – Development of the student's talent and skill through an intensive program of individual instruction. To be taken in conjunction with THTR 361 and 362. Open only to students in the B.F.A. (Acting) program. [2-2; 2-2]
- 400 (6) Direction and Staging Prerequisite: THTR 160 and permission of the instructor. [3-2; 3-2]
- 405 (3) Scenery and Costume Design – Advanced study of design principles, history, and practice. Intensive development of student's portfolio. Prerequisite: THTR 305. [2-2; 0-0]
- 410 (3/6) d 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: THTR 310 or 320. [3-0] or [3-0; 3-0]
- 415 (3/6) d Studies in Women and Theatre/Film – A course dealing with women's involvement in and contribution to various aspects of Theatre and/or Film. Topics will change from year to year. [3-0] or [3-0; 3-0]
- 430 (6) Theory of Drama and Performance – The basic principles of dramaturgy and theory of performance. Historical and contemporary writing on theatrical theory and criticism and their relation to theatrical practice. [3-0; 3-0]
- 449 (6) Supervised Study and Honours Essay
- 450 (3) Advanced Scenery – Technical direction; complex techniques and problems in scenery production. Prerequisites: THTR 305 and 350. [0-0; 2-2]
- 451 (3) Advanced Stage Lighting – Aesthetic principles, organizational methods, and graphic skills involved in lighting design for the stage. Prerequisites: THTR 305 and 351. [0-0; 2-2]
- 452 (3) Advanced Scene Painting – Scenic art; emphasis on trompe l'oeil, selected historic styles, and large-scale drops. Prerequisites: THTR 305 and 352. [0-0; 2-2]
- 453 (3) Advanced Costume – Complex problems and selected historical studies in theatrical costume design and construction. Prerequisites: THTR 305 and 353. [0-0; 2-2]
- 454 (3) Advanced Stage Management – Complex problems in stage and production management: script analysis, crew supervision, management procedures. Prerequisites: THTR 305 and 354. [0-0; 2-2]
- 459 (6) Advanced Technical Practice – Directed advanced work in actual production. May involve production internships at other theatres. Open only to fourth-year Design/Technical B.F.A. students. [0-6; 0-6]
- 460 (6) Styles in Acting – An introduction to styles of acting in various historical periods. Prerequisite: THTR 360 and permission of the instructor. Not open to B.F.A. (Acting)
- 461 (6) Advanced B.F.A. Acting – Performance and characterization in contemporary media and in leading and supporting roles in full-length plays. Prerequisite: THTR 361 and 362. Must be taken in conjunction with THTR 462 and 470. Open only to B.F.A. (Acting)
- 462 (6) Advanced Speech and Movement – The student will study speech and movement as they relate to social and theatrical history. Comparisons will be drawn between the styles of literature, costume, furniture and speech and movement. Prerequisite: THTR 361 and 362 and 370. Must be taken in conjunction with THTR 461 and 470. Open only to B.F.A. (Acting)
- 470 (6) Advanced Tutorial in Acting – Development of the student's talent and skill through an intensive program of individual instruction. Prerequisite: THTR 361 and 362 and 370. Must be taken in conjunction with THTR 461 and 462. Open only to students in the B.F.A. (Acting) [2-2; 2-2]
- 500 (3) Bibliography and Research Methods [2-3; 2-3]
- 505 (6) Design Studio I – Investigation of colour, texture, and light in scenery and costume design. [1-4; 1-4]
- 506 (6) Design Studio II – Advanced studio work in scenery and costume design for theatre, opera, and dance. [2-2; 2-2]
- 510 (3/6) d Seminar in Comparative Dramatic Literature
- 515 (3/6) d Seminar: Studies in Theatrical Style
- 520 (6) Direction and Production
- 521 (6) Styles in Directing – An advanced course in directing; detailed study of the major styles in the history of production. Prerequisite: THTR 520.
- 525 (3/6) d Seminar: Study of a Major Dramatist
- 530 (3/6) d Seminar: Relationships Between Theatre and the Other Arts – Studies in a selected area of theatre in relation to one or more of the other arts.
- 547 (3/6) d Directed Studies in Theatre and Drama and Film/Television
- 549 (6/12/18 c) Master's Thesis
- 550 (6) Studies in Historic Design – Seminar in theatre scenery, costumes, and architecture of selected historical periods. Pre- or co-requisite: THTR 505.
- 560 (3/6) d Studies in Theatrical History
- 561 (3/6) d Studies in Dramatic Literature
- 562 (3/6) d Studies in Dramatic Theory and Criticism
- 649 Ph.D. Thesis

Ukrainian **UKRN**
DEPARTMENT OF RUSSIAN AND SLAVIC
LANGUAGES AND LITERATURES, FACULTY OF
ARTS

325 (6) Basic Ukrainian [3-0; 3-0]

425 (6) Advanced Ukrainian Prerequisite: UKRN 325. [3-0; 3-0]

Urban Studies **URST**
FACULTY OF ARTS

200 (6) Cities – An introduction to urban patterns and processes from the perspectives of various disciplines. Guest lectures, discussion groups, field trips. [2-2; 2-2]

400 (3) Seminar in Urban Studies – A seminar for senior students who are anxious to explore some common topics of importance to urban studies from the viewpoints of several disciplines. Prerequisite: permission of the instructor. [1-2]

Urdu **URDU**
SEE ASIAN STUDIES, FACULTY OF ARTS

Urology
SEE SURGERY, FACULTY OF MEDICINE

Vascular Surgery
SEE SURGERY, FACULTY OF MEDICINE

Women's Studies **WMST**
FACULTY OF ARTS

For other acceptable courses, see Index under Women's Studies

100 (6) Introduction to Women's Studies – An interdisciplinary exploration of the situation of women in various societies, both past and present. Theoretical analyses, research, and literary sources are used to broaden understanding of the determinants of women's experience. [3-0; 3-0]

224 (6) Women in Literature - Techniques of literary study, with emphasis on the ways in which women are represented in and have contributed to the literary tradition. [3-0; 3-0]

300 (3) Introduction to Gender Relations – An interdisciplinary exploration of gender, sexual identity, and gender relations, emphasizing historical and cross-cultural aspects and the social construction of masculinity and femininity. [3-0]

322 (6) Women's Studies in the Social Sciences – Historical and current examination of feminist scholarship in the Social Sciences, with emphasis on explanatory systems, their relationship to methods of inquiry, and policy implications. Prerequisites: WMST 100. [3-0; 3-0]

324 (6) Women's Studies in the Humanities – Historical and current examination of feminist scholarship in the Humanities, with emphasis on processes of representation in historical discourses, philosophy, religion, language, and cultural institutions. Prerequisites: WMST 100. [3-0; 3-0]

422 (3) Advanced Research Seminar in Women's Studies: Social Sciences – Review of research methods in the Social Sciences, including supervised independent research project. Prerequisites: WMST 100, 322 and 324; enrolment limited to fourth year majors. [3-0]

424 (3) Advanced Research Seminar in Women's Studies: Humanities – Review of research methods in the Humanities, including supervised independent research project. Prerequisites: WMST 100, 322, and 324; enrolment limited to fourth year majors. [3-0]

425 (3/6/12) d Special Topics in Women's Studies – Examination in depth of selected topics in Women's Studies. Consult the Women's Studies Office for course offerings. May be repeated for credit. Prerequisites: WMST 100 or 224, or permission of the instructor. [3-0]

450 (3/6) d Directed Studies – General reading and/or a research undertaking, with the agreement, and under supervision of a faculty member selected by the student and approved by the Head of the Faculty Members Department and the Chair of Women's Studies. A written paper or equivalent will be required.

Wood Science and Industry **WOOD**
SEE FORESTRY

Zoology **ZOOL**
DEPARTMENT OF ZOOLOGY, FACULTY OF SCIENCE

All undergraduate courses in Zoology are listed under Biology.

Zoology – Note: The following courses have been renumbered and transferred to Biology (old Zoology numbers in brackets): (203) 204, (303) 353, (304) 331, (305) 326, (306) 325, (307) 354, (311) 327, (316) 305, (323) 310, (325) 337, (340) 347, (400) 416, (402) 414, (403) 401, (404) 402, (405) 450, (406) 403, (407) 431, (408) 453, (409) 440, (411) 425, (412) 413, (413) 328, (415) 426, (416) 427, (417) 437, (419) 441, (420) 435, (421) 408, (423) 410, (425) 432, (427) 430, (428) 454, (429) 455, (430) 409, (431) 456, (440) 447.

500 (3/6) c Directed Studies in Zoology

502 (6) Ecology Seminar

503 (6) Comparative Animal Physiology Seminar

504 (3) Ethology Seminar

505 (6) Cell Biology Seminar

519 (6) Topics in Parasitology

521 (6) Fisheries Biology and Management

522 (4) Limnology Seminar Prerequisite: ZOOL 502. Offered in alternate years.

523 (6) Fish Behaviour and Ecology Seminar

525 (3) Systematics and Evolution Seminar

527 (6) Theoretical Population Dynamics Recommended corequisite: ZOOL 502.

549 (6/12/18 c M.Sc. Thesis

649 Ph.D. Thesis

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